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More Tools Made With Fewer Men

Elimination of Manual Handling Has Speeded Up Production—Twice as Much Output per Man

BY FRED L. PRENTISS*

PRODUCTION has been increased and labor costs have been sharply reduced in the plan of the Vlchek Tool Co., Cleveland, by the installation of materials-handling equipment, through the use of which hand lifting has been almost eliminated while the work is moving through the various manufacturing operations. A complete cycle of materials handling is provided, from the unloading of the stock from cars until the finished tools reach the shipping platform. The handling equipment includes gravity-roller and live-roller conveyors, belt conveyors, elevators, elevating buckets, monorails and cranes. No stock in process is piled up on the floors, and the work is kept moving almost continuously from the time it enters the machine shop until it reaches the storage department. Intermediate storage is confined to some work in process, mostly tools that require polishing.

PRESSES in the Trimming Department Are Arranged in Two Rows, Between Which Is an Apron-Type Conveyor Slightly Below the Floor Level, on Which the Flashings Are Discharged. This carries them outside the building, and eventually into a freight car. Forgings pass from the machines through chutes to bucket elevators, which carry them to the storage floor above

One step in the rearrangement for greater production and economy in handling that is now being made, but is not yet fully completed, is the elimination of storage bins for finished products. The bulk of the tools comprising the big production and fast moving items, instead of being placed in storage bins and taken out from bins for shipment, are stored in the standard shop boxes in which they are carried through the machine shop and other departments for succeeding operations. These boxes of finished stock are piled in tiers in the stock room. Storage in bins, with the rearrangement of the stock room, will be confined to certain small and slowly moving tools.

The company manufactures drop-forged hand tools, including hammers, automobile, open-end and other types of wrenches, chisels, punches and screw drivers. A portion of the product is assembled into automobile tool kits. The forgings are delivered to the machine shop in standard shop boxes, in which they travel in standard quantities through the various departments until they reach the stock room, where they are stored in the same boxes. Platform scales are provided at various points in the gravity conveyor lines for counting the pieces by weight. These make a count within 1 per cent of accuracy, which is regarded as close enough for production purposes. When the tools reach the inspection department they are accurately counted by weight by a computing scale located in the gravity conveyor line.

Stock in the form of steel bars is unloaded from cars with a monorail trolley that extends out over the receiving platform and through the raw stock room.

*Resident editor at Cleveland for THE IRON AGE.

which adjoins one end of the forge shop. Stock used for chisels, screw drivers and other products that are not forged on drop hammers is cut to length in the forge shop, and goes to trip-hammers and upsetters. All stock that goes to the drop forging machines is delivered to the hammer men in full length bars, which are worked down until the stock is used up. Bars are loaded on skids in the stock room. An electric lift truck takes the skids down aisles on either side of the forge shop and sets them in front of hammers located in two rows near the center. The forging equipment includes 22 drop hammers.

Forgings drop from the hammers into corrugated steel boxes which are 22 x 40 in. x 24 in. deep. These boxes are picked up by a hand-propelled overhead trolley, equipped with 2000-lb. electric hoist, which extends through the center of the forge shop between the two rows of hammers, and are carried to an adjoining trimming department. This is located in a two-story structure, the upper floor of which, used for the storage of forgings, both before and after trimming, is served by a 1-ton electric traveling crane. Boxes of forgings are raised through an opening in the floor at one end of the trimming department and are kept in storage in the boxes in which they are received.

Nine trimming presses are arranged in two rows on the first floor. The boxes of stock are let down from storage through two openings in the floor, one on each side near the center of the building, one opening for delivering forgings being provided for each line of presses. Boxes as emptied at the trimming presses go back to the forge shop. Some of the trimming presses, used in trimming forgings for tools that are made in large quantities, are equipped with rotary trimming fixtures.

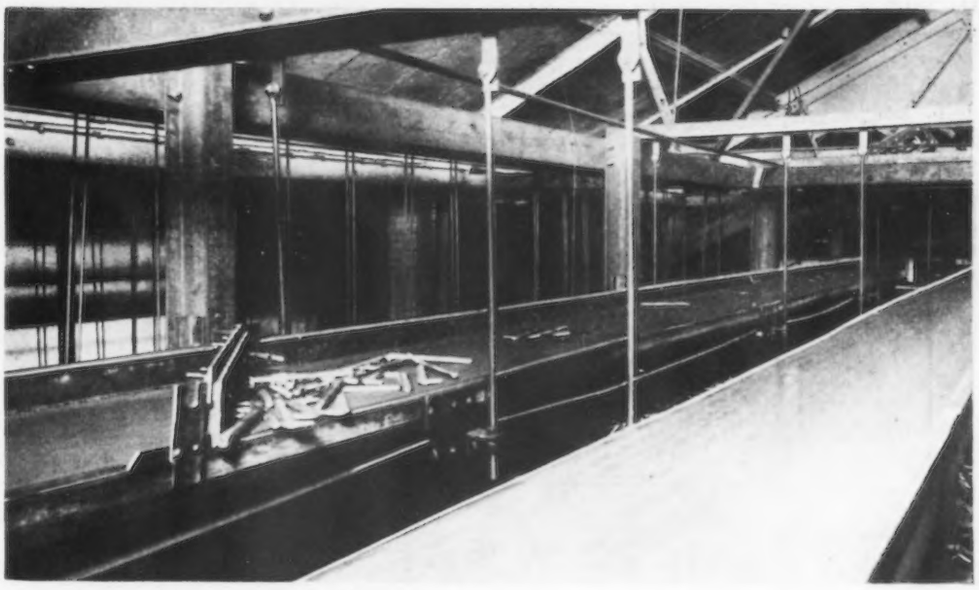
Forgings fall from the trimming presses through underground chutes and are delivered into bucket elevators. These carry them back to the storage floor above, and dump them into shop boxes similar to those used for bringing the work from the forging hammers to the trimming department. The flashings fall on to a steel apron-type conveyor which extends, just below the floor level, between the two rows of trimming presses. This carries them outside of the building, where the conveyor rises a few feet and discharges them into a large steel scrap box. An overhead electrically operated monorail carries the box of scrap to an elevated bin, into which the contents are dumped by opening the bottom of the box. The scrap bin is located alongside a railroad siding, and the flashings are chuted from the storage bin into a car, upon opening the side of the bin.

Trimmed forgings, after being taken back to the second or storage floor, are carried by the storage floor crane to the opposite side of the room. Here they are delivered to tumbling mills located on a mezzanine floor between the storage room and trimming department. Steel plate sections form a floor covering over the tumbling mills. One of these sections may be raised, providing an opening in the floor through which the work is dumped by the crane into the tumbling mill beneath. There are four tumbling mills, with 24 x 40-in. and 28 x 40-in. barrels.

From the tumbling mills the forgings are discharged

EACH Coining Press Is Equipped With Feeding Mechanism Operated by an Endless Chain. The operator lays the tools in a holder attached to a revolving steel belt or carrier. They are discharged at the back of the machine into a bucket elevator which carries them to storage bins

BUCKET Elevators (Above) Delivering the Forgings from the Trimming Department to the Storage Floor Above. The work is discharged from the buckets through chutes into shop boxes, which an overhead crane carries to the opposite side of the room, dumping the contents through the floor into tumbling mills



FORGINGS Carried From the Coining Presses by Bucket Elevators Are Discharged on the Two Belts Shown, Located Above a Series of 30 Storage Bins at One End of the Machine Shop. The movable plow shown near left in the picture is set to push the work into any desired bin. Where the pieces go from the bins is indicated at bottom of page

into chutes which converge into one main chute, through which they fall into a shop box placed on a hand truck on the trimming room floor. This arrangement for handling work through the tumbling mills by gravity eliminates hand labor in loading and unloading the mills. Only one man is required for handling the forgings on the second floor, to which they make the two trips, before and after trimming. The man's work includes also loading and tending to the operation of the tumbling mills.

Boxes loaded with forgings delivered from the tumbling mills are pushed a short distance to coining presses, for straightening and sizing. The two coining presses are of 400-ton and of 600-ton capacity. Each press is equipped with an efficient feeding mechanism which was developed in the plant. This consists of a work carrier attached to an endless chain. The operator, standing in front of the press, places the forgings on the carrier, which carries them through the press. After the coining operation the work falls off the carrier on to an incline and thence into a bucket conveyor. The 600-ton press is operated at the rate of 38 strokes a minute and the 400-ton machine at 40 strokes a minute. Not only is production increased by the feeding mechanism, but the injury hazard is entirely eliminated.

The bucket elevators which handle the work from the coining presses deliver the forgings to a short belt booster conveyor. The latter discharges them through chutes on to a long belt conveyor located above a series of wooden bins above one end of the adjoining machining department. There are two of these belt conveyors, each 18 in. wide. The bins, about 30 in number, are 6 ft. high, 6 ft. deep and of various widths. A separate bin is provided for each kind of forging. These are discharged from the belt into any desired bin by means of a discharge plow. These conveyors are similar in operation to belt conveyors used to deliver sand into hoppers above a foundry floor.

Each bin has a slanting bottom leading to a hopper on the front side. Smaller forgings are dumped from the hoppers into shop boxes on a gravity roller conveyor extending alongside the bins. Some of the larger forgings are taken out of the hoppers by hand and piled into the boxes.

These boxes are the standard containers, in which

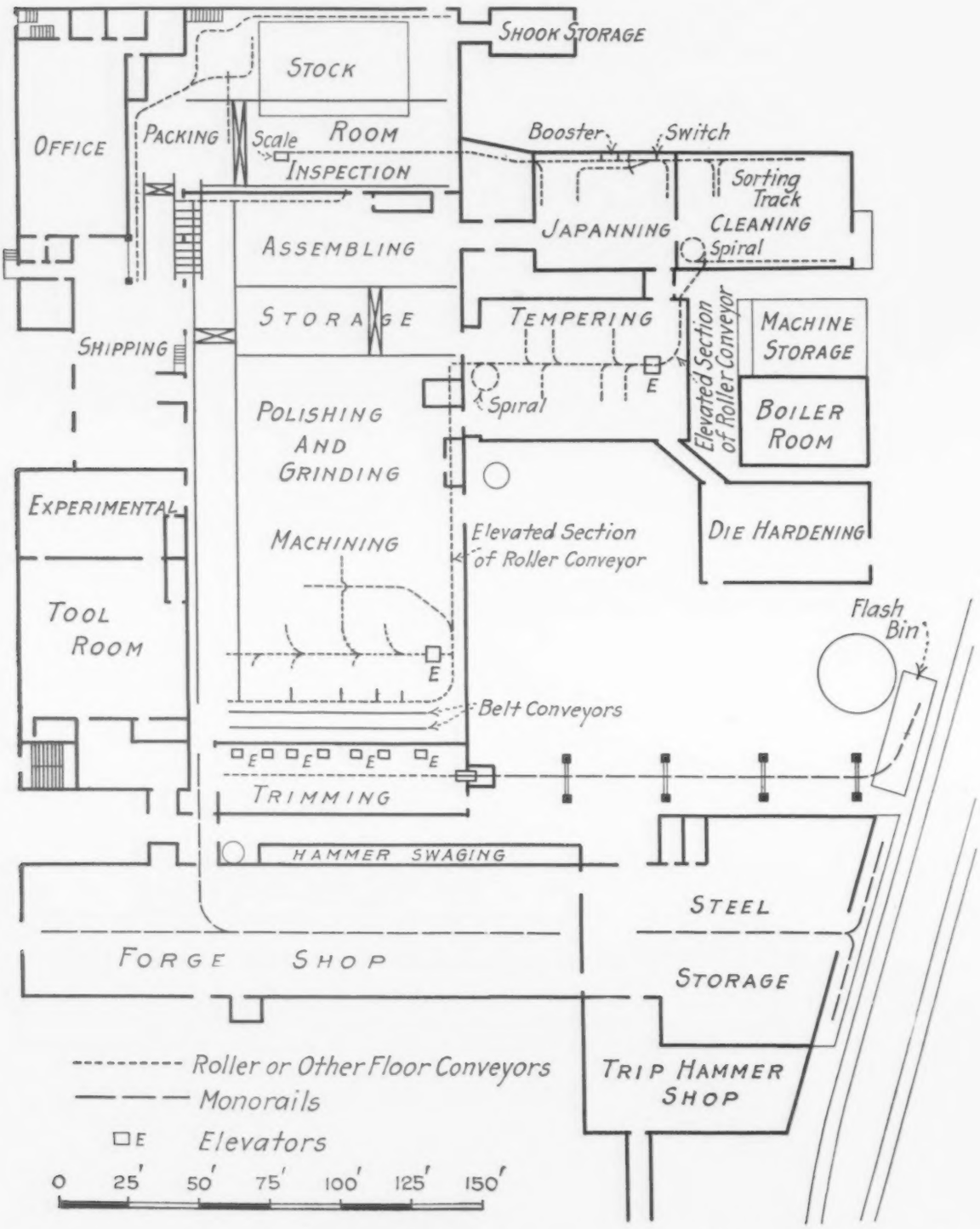
FRONT of the Storage Bins, the Belt Conveyors Being Back of the Railing Above, Which Incloses an Aisle at the Side of the Conveyors. Tools are dumped from the hoppers into the standard shop boxes shown or, if large tools, are removed from the hoppers by hand and piled in the boxes. From the gravity conveyor alongside the bins the boxes move to other gravity conveyors, two of which, shown in the picture, lead to the milling machines

the work is carried through the plant for the various processes after leaving the storage bins for finished forgings, and finally for the storage of the finished product. They are of pressed steel, 18 x 18 in. x 12 in. deep, and have a maximum capacity of 500 lb.

When loaded from the bin, the box moves along the gravity conveyor at the side of the bins and on to another of a series of gravity conveyors which form a network of conveyors that feed the milling machines. After milling the operator throws the work into shop boxes on an opposite gravity conveyor.

This is one of various feeder lines that lead from the milling machines to a live roller conveyor 12 in. above the floor. The live conveyor carries the boxes to an electrically operated elevator at one side of the machine shop. As soon as the box is on the carriage the elevator automatically is set in motion and the box is carried up to a point near the ceiling. Here it is automatically discharged on to an overhead gravity conveyor which carries it to the tempering department. There a spiral section of the gravity conveyor carries the box down to the working level.

In the tempering department there is a dividing point in the movement of the work. Forgings which do not require tempering move, on leaving the spiral, in a straight line on a gravity roller conveyor located between cyanide tempering furnaces. Near the opposite end of the tempering room this conveyor connects with an automatic elevator, similar to that in the machine department, except that it is air-operated. This hoist raises the boxes to an overhead gravity conveyor, on which they are carried to the cleaning department.



LAYOUT of the Plant, Showing Arrangement of Conveyor and Monorail Systems and How They Serve the Several Manufacturing Departments

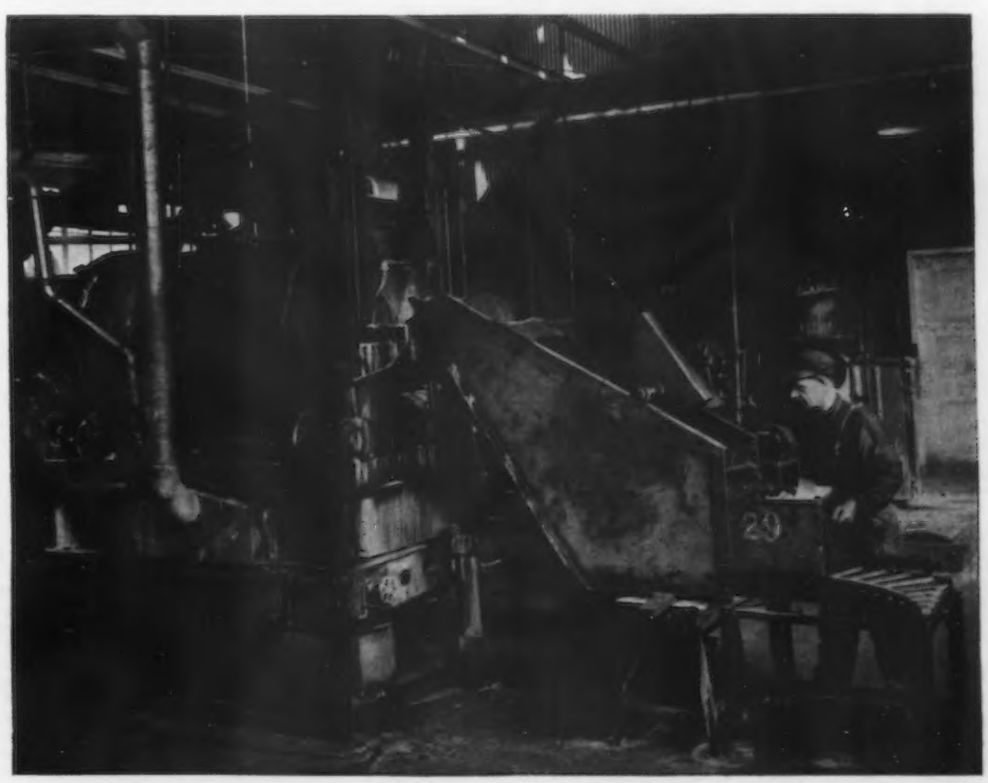
AFTER the Tools Are Machined They Are Put Back in Shop Boxes Which Are Placed on Other Gravity Conveyors Feeding into the Live Roller Conveyor in Center. They move on this to the steel-frame elevator in background. A box moving on to the elevator is automatically lifted and is discharged near the ceiling on to a gravity conveyor which takes it to the tempering department

Here a second spiral conveyor carries the boxes down to the working level.

On reaching the bottom of the spiral in the tempering department, boxes of tools to be tempered are switched to a gravity conveyor line which extends in front of the furnaces. Here they are delivered to bundling tables, where they are placed in baskets or wired in bundles for immersion in the cyanide bath. Levers suspended from overhead tracks are provided for handling the work in and out of the furnaces and into the quenching tanks. From the latter the hardened tools are dumped into shop boxes on a short section of gravity conveyor provided on each side of the furnace. These conveyors feed back into the conveyor line referred to above, which extends between the rows of furnaces and leads to the cleaning department.

In the cleaning department the forgings pass along a gravity conveyor at the side of the room and from this are switched on to a short section of portable conveyor mounted on wheels. A box of work is pushed off the main conveyor line on to the portable roller conveyor, and the truck on which this is mounted is moved 3 or 4 ft. to the loading end of a cleaning machine. The box is shoved into a mechanically operated hopper which, when raised, lifts the forgings and discharges them into the machine. At the discharge end of this machine they pass into boxes on another gravity-roller conveyor. With this tie-up of the cleaning machine with the roller conveyors, at both its loading and discharge ends, hand lifting of work going through this machine is avoided.

The cleaning machine consists of two connected



IN the Cleaning Department Forgings Pass Along a Gravity Conveyor at the Side of the Room (Not Shown) and Are Pushed on to a Short Section of Portable Conveyor. This is pushed 3 or 4 ft. to the mechanical loading hopper of the machine. The end of this hopper is raised to discharge the work into the tumbling mill, which is the first unit of the cleaning machine

units. The first includes a tumbling mill with large-diameter drum in which the work, 1500 to 2000 lb. to a load, is tumbled in a hot cleaning solution for 15 to 25 min. Then the rotation of the barrel is reversed and the forgings are carried into a smaller perforated drum, in which the solution is drained off. From this they are dumped into a washing unit consisting of a large metal drum, in which they are washed in water containing a rust-proofing solution. From this unit the tools pass through a wire screen drum for drying and from the latter are discharged, both clean and dry, into a shop box on a gravity conveyor. The cleaning machine was built by the Ideal Concrete Machine Co.

Leaving the cleaning department, tools move on the gravity conveyor to the inspection department, or if they are to be japanned are switched through the japanning department. A short motor-driven booster section is provided in the conveyor line in this department, to raise the work a few feet so that it can continue its movement by gravity.

In the inspection department the tools are inspected and weigh-counted. The boxes, except those containing tools which are to be packed loose, are picked up by a ½-ton traveling crane equipped with electric hoist and piled, five boxes high, in the storage room adjoining. From here they are sent over short roller conveyors to the assembling department, where tool kits are assembled and packed into boxes. Tools which are to be loose-packed go, in their shop boxes, on a gravity roller conveyor from the inspection department to the loose-packing store room, where they are stocked four boxes high. From these boxes they are transferred to packing boxes.

A roller conveyor extends the length of the shipping room. This is used for conveying the packed shipping boxes to a scale for weighing, the covers being nailed on them on the conveyor from which they are transferred to a truck for shipment. It is used also for bringing empty shipping boxes to points at which they are to be packed, and for taking empty shop boxes out of the shipping room. These are loaded on electric trucks and are taken back to their starting point beneath the discharge hoppers of the bins at the side of the machining department. Other cranes, and monorails and hand trucks also, serve the store room and the assembly and packing departments.

The gravity and live-rolled conveyors, belt conveyors and elevators operating in conjunction with the roller conveyors were supplied by the Mathews Conveyor Co.

In 1918 the Vlchek company had 16 drop hammers and employed 480 men. In 1927 it had increased its drop hammers to 22 and reduced its working force to 280 men; and with the reduced labor force it had increased its output 30 to 40 per cent. The increased production is not attributed entirely to the installation of materials-handling equipment, as various other changes have been made to increase the plant efficiency. Improved materials-handling facilities have created a demand for more rapid production tools in the machining department, and speedier tools have called for the faster moving of material. Consequently the two factors, the use of more rapid machine tools and the better materials-handling facilities, have gone hand in hand.

As work no longer piles up in process, a marked reduction has been made in the time it takes to go through the plant. Formerly in its usual routing it took an open-end wrench from three to four days from the time the blank reached the forging hammers until the finished tool reached the stock room. Now it is stated that that tool, finished, can reach the stock room 6 hr. after forging.

WELDED CONDUIT PIPE

Thin-Wall Steel Conduits, Electrically Welded, Offered in Place of Heavier, Standard Pipe

AN electrically-welded conduit pipe for carrying electric wires in buildings has been developed by Steel & Tubes, Inc., Cleveland, which will place the new product on the market shortly. This is a thin-wall conduit which will be known as "Steeltubes" metallic tubing. It will be fabricated from cold-rolled open-hearth strip steel and welded under a process used by the company in the manufacture of electrically-welded tubing for the automotive and other industries. The process and product will be covered by patents owned by the company. A continuous process is used in both forming and welding the tubing.

Additional operations required for making the tubing for conduits will include galvanizing the exterior and enameling the interior, to provide a smooth raceway for the wires as well as to resist corrosion. After being formed and welded, the tube will be run through a continuous automatic machine in which it will be cleaned and dried and then galvanized and enameled. Experimental work in developing the tubing has been under way for several years.

The conduit will be made in ⅜-in., ½-in., ¾-in. and 1-in. diameters, of 17, 18 and 19-gage strip steel, which it is stated provides a wall of more than the required strength for electric tubing. It is expected that 80 per cent of the product will be in one size, of ½-in. stock. With a production mainly of one size, and in standard lengths, a large output can be obtained from one manufacturing unit.

Since the introduction of steel conduit pipe for carrying electric wires, standard steel pipe has been used for this purpose. This pipe, it is contended, is heavier than required and its use results in a needless waste of steel. However, the comparatively heavy wall is necessary to carry the threads and allow the use of standard fittings. It is asserted, also, that the development of electrical conduit in the lighter and cheaper form will result in more general use of steel electrical conduits than at present. One advantage claimed for the welded steel conduit is its economy in installation. The ends will be joined by a slip coupling, eliminating threaded joints, and the only tools required for installation will be a hacksaw and wrench.

The electrical committee of the National Fire Protective Association, compiler of the National Electrical Code, at its recent annual meeting decided to change the code to allow the use of electrical metallic tubing, and will provide installation rules covering its use. It is expected that this tubing will be listed shortly as a standard by the Underwriters' Laboratories, Inc.

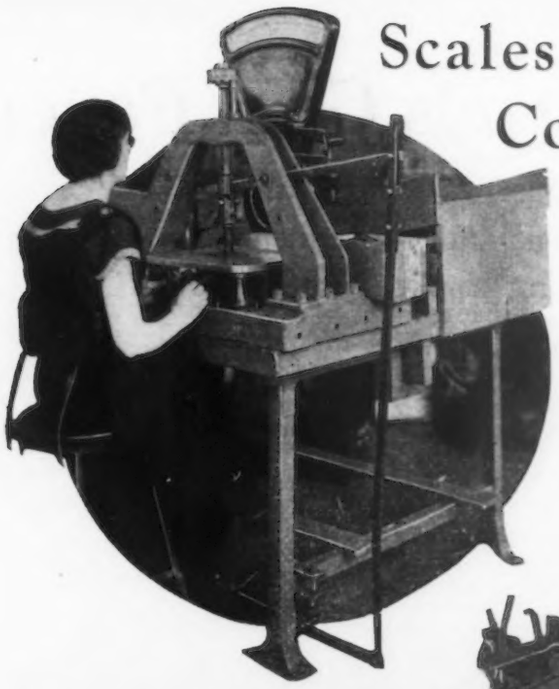
Steel & Tubes, Inc., will begin the manufacture of the metallic tubing shortly at its Brooklyn, N. Y., plant and later will add departments for its manufacture in some of its other plants.

To Study Annealing of Crane Chain

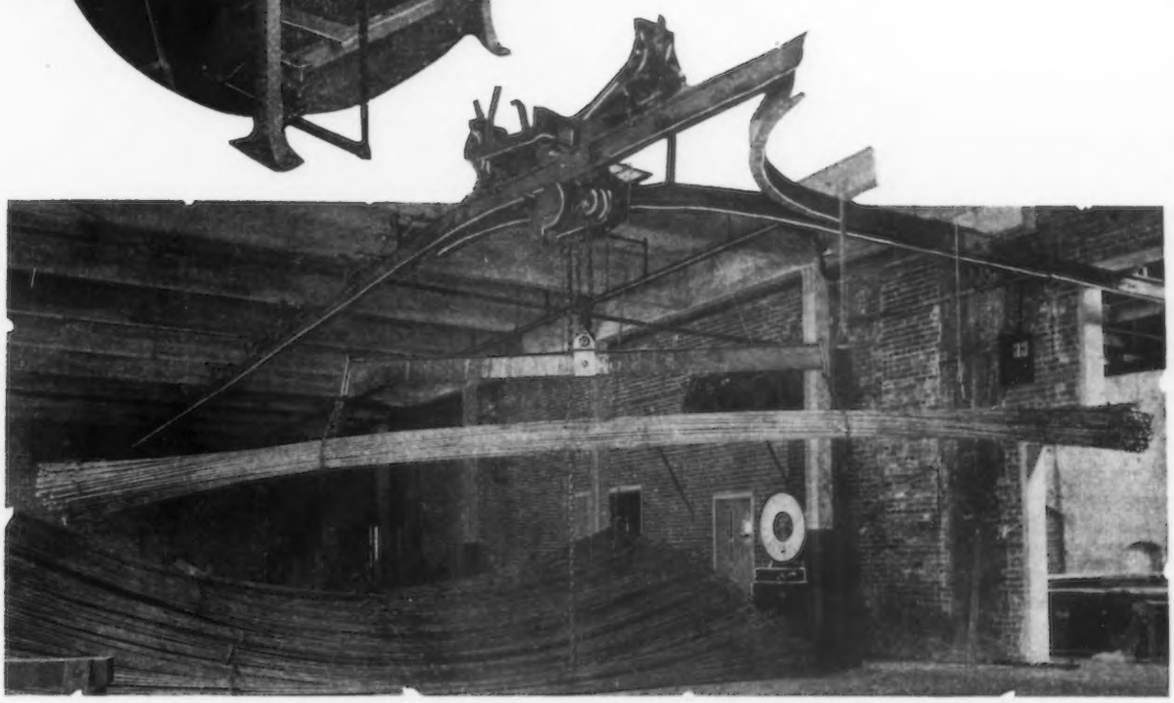
A committee of the National Safety Council has arranged with the Carnegie Institute of Technology, Pittsburgh, to conduct a series of tests on ½-in. chain. The proposed investigation will cover the following items:

(1) Analysis of chain stock; (2) tension-proof load and tension test to destruction of chain as received; (3) impact test of chain stock; (4) chain as received to be subjected to a repeated stress test; (5) tension-proof load and tension test to destruction of chain after test 4; (6) impact test of chain stock after being subjected to a repeated stress test; (7) anneal chain at various temperatures; (8) cooling chain in air and in furnace after being heated for annealing; (9) tension-proof load and tension test to destruction of chain after each annealing and cooling operation has been completed; (10) impact test of chain stock after each annealing and cooling operation has been completed; (11) study of the effect of low-temperature heating, following the same procedure as given above; (12) metallographic studies of chain under the various conditions outlined above.

Scales Used for Production Control and Inspection



SPRINGS of all sorts, but especially automobile leaf springs and gas engine valve springs, are tested by measuring the weight required to compress them completely. The Packard Motor Car Co. has devised a simple attachment to a platform scale whereby the force required to compress each motor valve spring a definite distance can be tested.



AN overhead monorail scale enables the S. M. Jones Co., Toledo, Ohio, to keep close check on all drill rods, either coming from plant to warehouse or from warehouse to railroad car. Since weight and number of units are interchangeable in all items of mass production, small parts may be most readily counted by weighing the unknown quantity against a known number placed in a counterpoise pan.

PRODUCTION control at Wilson Foundry & Machine Co., Pontiac, Mich., requires weighing molten pig iron at the cupola. It is easily accomplished by means of a forehearth ladle discharging into bull ladles. A section of trolley track at the cupola is hung from scale levers, and the weight of the iron is plainly visible on a large dial. This and the other photographs were taken for the Toledo Scale Co., Toledo, Ohio.

Low-Manganese Steels Gain Favor

May Be Heat Treated to Properties Comparable with More Expensive Alloy Steels and Consequently Are Finding Increasing Application

BY JEROME STRAUSS*

RECENT years have witnessed an increasing interest in alloy steels containing the low-cost elements silicon and manganese, particularly in such compositions as secure high hardness and good ductility. The largest tonnage has contained manganese as the principal alloying element; 0.9 per cent manganese may be regarded as the amount separating a common steel from an alloy steel. Most of the commercial production has been of steels containing 0.3 to 0.5 per cent carbon and 1 to 2 per cent manganese. Steels containing lower carbons and manganese up to 4 per cent have been the subject of much study. However, this paper is concerned with steels of the former range.

For all these carbon-manganese steels, the foremost American proponent has been John Howe Hall (THE IRON AGE, Sept. 28, 1922, page 786), particularly for their use as castings. Recently, however, several American producers of rolled steel bars have manufactured manganese steels in quantity, and their use for forgings or articles machined directly from the bars has spread rapidly. Lower-carbon steels of 1 to 2 per cent manganese are being applied both for carburized parts and for pressings or forgings, but they will be omitted from this discussion.

*Material engineer, United States Naval Gun Factory, Washington. This is an abstracted version of a paper read before the Montreal meeting of the American Society for Steel Treating.

Critical Points Displaced So Air-Hardening May Result

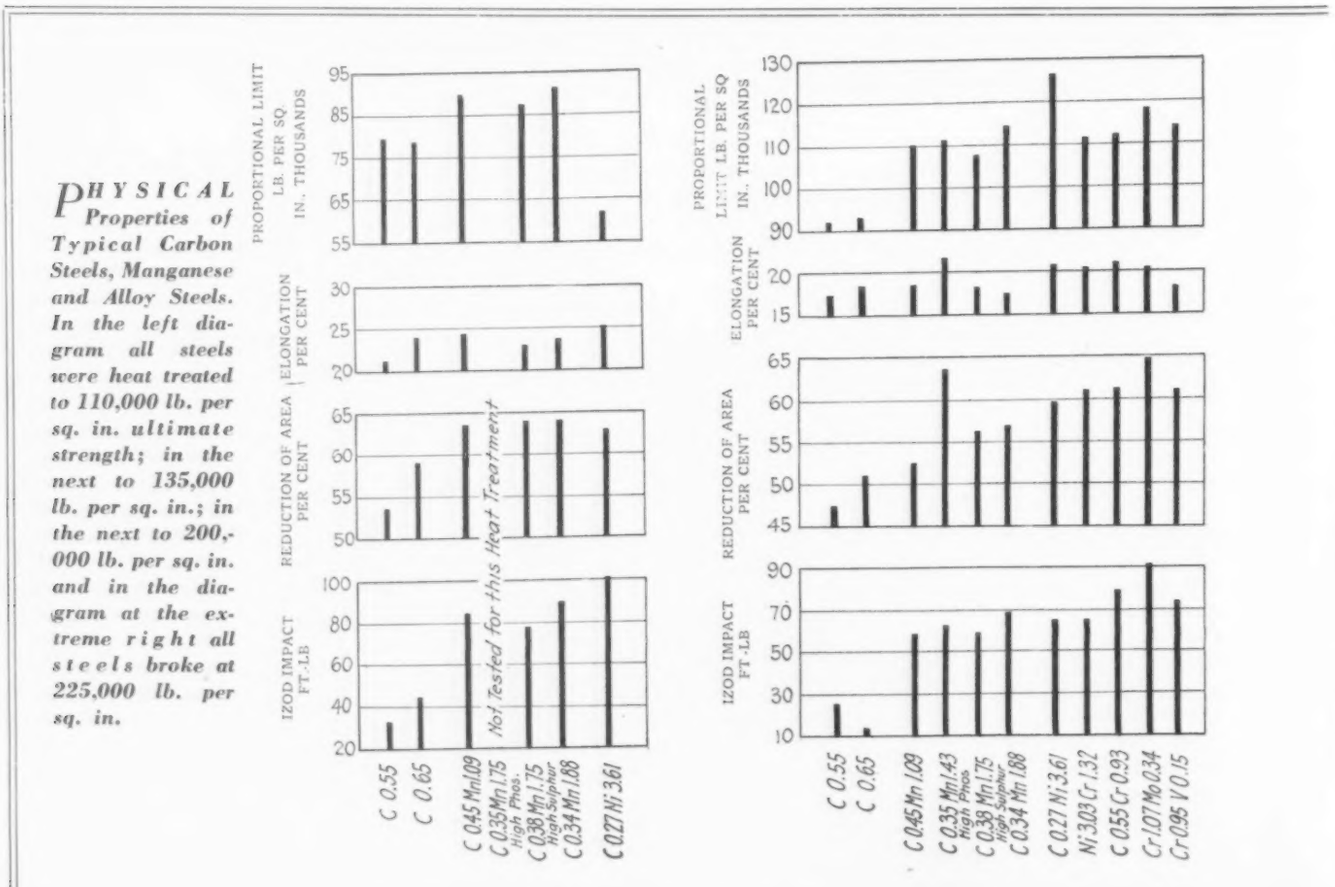
Published data on critical points yield approximate information tabulated below:

Ac_1 is lowered 11 deg. Fahr. for each per cent manganese.
Ac_3 drops 110 deg. Fahr. at 1 per cent Mn; thereafter little change.
Ar_1 is lowered 90 deg. Fahr. or more for each per cent manganese.
Ar_3 is lowered 125 deg. Fahr. for each per cent manganese.

Since A_3 is lowered more rapidly than A_1 with either carbon or manganese, the two overlap in a steel containing 0.40 per cent carbon and 2.0 per cent manganese, or another containing 0.20 per cent carbon and 3.0 per cent manganese.

Obviously the above involves a lowering of the eutectoid carbon content, which appears to be about 0.78 carbon for 1.0 per cent manganese, or 0.50 carbon for 3.5 per cent manganese.

One very important feature of the lowered transformations is the ability to harden at temperatures below the usual quenching point, after a furnace cooling from the latter. On ½-in. sections, for instance, a 0.45 C, 1.09 Mn steel heated to 1550 deg. Fahr., slowly cooled to 1300 deg. and quenched, is just as hard as


PROPORTIONAL LIMIT LB. PER SQ IN., THOUSANDS
ELONGATION PER CENT
REDUCTION OF AREA PER CENT
IZOD IMPACT FT.-LB
Not Tested for this Heat Treatment
C 0.55
C 0.65
C 0.45 Mn 1.09
C 0.35 Mn 1.75 High Phos.
C 0.38 Mn 1.75 High Sulphur
C 0.34 Mn 1.88
C 0.27 Ni 3.61
C 0.27 Ni 3.61
Ni 3.03 Cr 1.32
C 0.55 Cr 0.93
Cr 1.07 Mo 0.34
Cr 0.95 V 0.15

PHYSICAL Properties of Typical Carbon Steels, Manganese and Alloy Steels. In the left diagram all steels were heat treated to 110,000 lb. per sq. in. ultimate strength; in the next to 135,000 lb. per sq. in.; in the next to 200,000 lb. per sq. in. and in the diagram at the extreme right all steels broke at 225,000 lb. per sq. in.

though quenched from 1550. That the tension and impact properties do not suffer from this method of heat treatment is indicated by the following data for 1-in. sections of a 0.51 C, 1.17 Mn steel:

	Quenched from 1500 deg. Fahr.	Heated to 1500 deg. Quenched from 1350 deg. Fahr.
Ultimate	144,100 lb. per sq. in.	142,800 lb. per sq. in.
Proportional limit	101,900 lb. per sq. in.	109,500 lb. per sq. in.
Elongation in 2 in.	17.5 per cent	17.1 per cent
Reduction in area	53.2 per cent	52.6 per cent
Izod impact.....	62.5	62.6

Properties of Heat-Treated One-Inch Bars

In order to compare the properties of manganese steel with those of the more conventional analyses, a series of tests were made which are summarized in the four diagrams at the bottom of the page. Values plotted are the results of interpolations between averages of two tension and four impact tests for each heat treatment.

Bars heat treated to moderate strength were annealed at 1450 to 1500 deg. Fahr., then quenched and tempered to develop 110,000 or 135,000 lb. per sq. in. ultimate strength; then machined to size. Tension bars were ½ in. in diameter; 2 in. gage length, with threaded ends. Izod impact bars were 10 mm. square, 4 in. long. Each had two Mesnager notches (drilled hole, 2 mm. in. diameter, with center 1 mm. below the surface). When heat treated for 200,000 lb. or over, the tempering temperatures were below 900 deg. Fahr. In this instance the tension and impact bars were normalized and annealed, then rough-machined 0.035 in. oversize and the impact bars drilled, then all were heat treated and finally finish-ground. This method gives a better indication of the properties of steels which are to be used for gears, springs and other parts similarly processed.

Although comparisons rarely show superiority in all properties, it becomes immediately apparent from the diagrams that manganese steels, and especially those higher in this added element, are more closely allied to the other structural alloy steels than to carbon steel. It is also of interest that neither moderately high phosphorus (0.078 per cent) nor moderately high sulphur (0.103 per cent) adversely affect the strength and toughness.

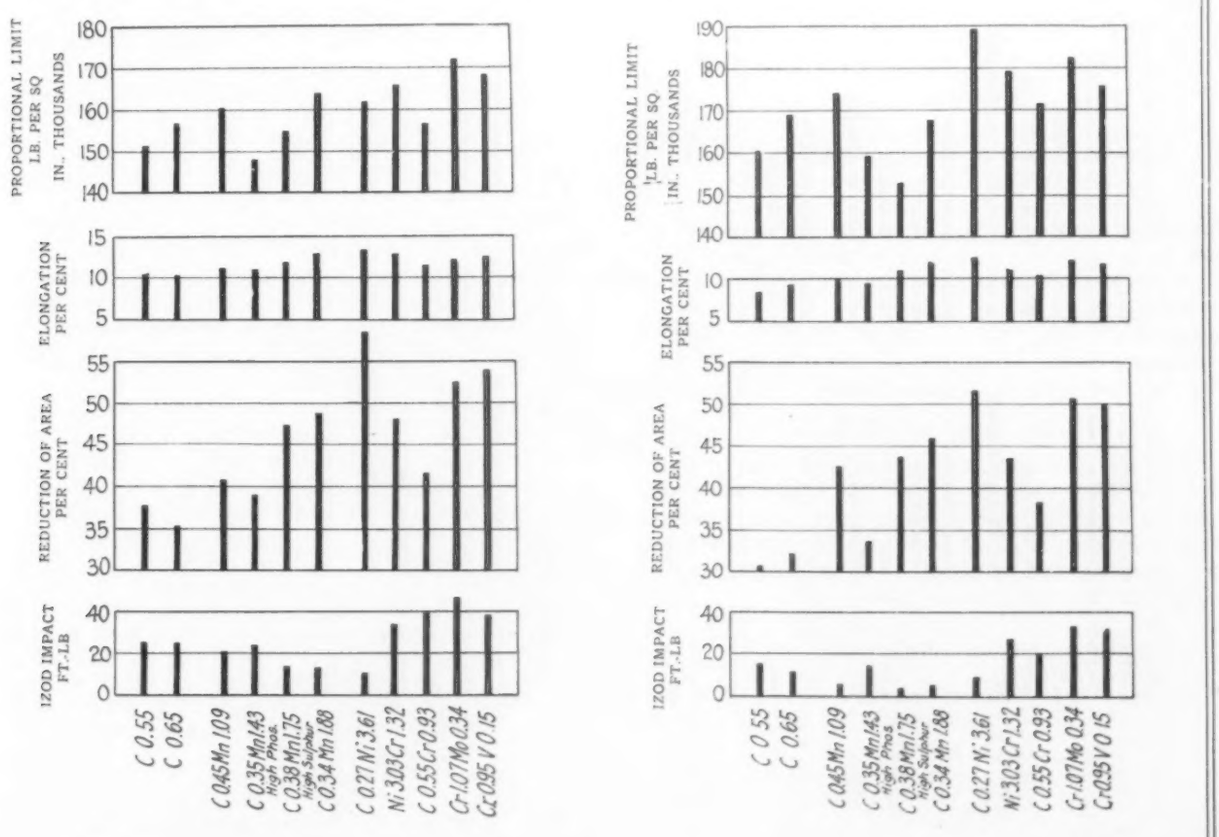
Overheating Not Especially Damaging

As a result of the efforts of Hall and others, the association of "brittleness" with steels of manganese containing more than 1 per cent has almost vanished. One additional item of evidence may be cited. Steels showing undue sensitiveness when quenched rapidly enough to produce high hardness might be expected to show deterioration in ductility or impact resistance, or to crack when quenched after overheating. To determine this point, a number of tension and impact test bars were quenched from a temperature 200 deg. Fahr. higher than that usually employed. Comparing these data with those of the diagrams showed that the deterioration in elongation or impact is no greater than in the other alloy steels (in many cases of both no decrease was noted). The losses by cracking were no greater for manganese steels quenched in water than for the chrome-nickel steels quenched in oil and far less than for the chrome steel quenched in water.

It will be noted from the graphs that Izod impact values of the manganese steels in the higher hardness ranges are below some of the other alloy steels. Other and more complex heat treatments were tried without improving this result.

Temper Brittleness Depends on Method of Manufacture

J. A. Jones of the research department, Woolwich Arsenal, England, in Report No. 61 on "The Properties of Medium-Carbon Steel with High-Manganese Content" expresses the opinion that such steels have an increased likelihood of temper brittleness, very marked at 2 per cent manganese. The same author suggests a method of determining the degree of susceptibility to this defect. This test consists in tempering the hardened specimens at 1050 deg. Fahr., cooling half of them

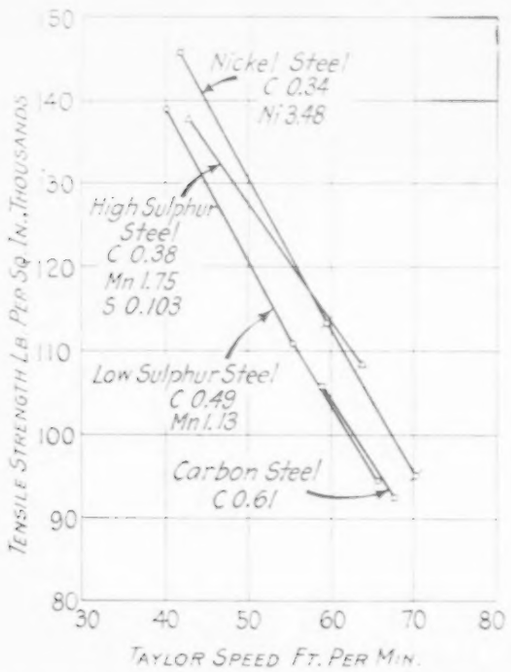


in the chosen quenching medium (water) and the other half at the desired slow rate (0.5 deg. Fahr. per min.). These same pieces are then all reheated to the same tempering temperature, but those which were cooled slowly are now quenched, and vice versa. Data secured in this manner follow:

Analysis		Izod	Izod	
C	Mn	Slow-Cooled	Quenched	Ratio
0.45	1.09	43.5	60.8	1.40
0.46	1.12	71.3	76.6	1.07
0.51	1.17	49.3	53.3	1.08
0.33	1.34	49.4	58.5	1.19
0.38	1.75 (high S)	55.1	61.1	1.11
0.34	1.88	30.5	64.0	2.10

One of the least temper-brittle chrome-nickel steels that was available to the author was hardened in oil and tempered at 1080 deg., and the ratio secured was 1.11.

Embrittlement on slow cooling found in this way was much less than anticipated. Chrome-nickel steels often show these effects, and, when tested by both the British standard notch and the Mesnager notch, ratios



Cutting Tests Show That a High-Sulphur Manganese Steel Is Less Damaging to Roughing Tool Than Lower-Sulphur Steels

have been reported as high as 30. But since these steels are being produced continuously with ratios of less than 1.5, methods of manufacture can doubtless be adjusted so as to reduce greatly this susceptibility to temper-brittleness. It is possible that the temper-brittleness in the manganese steel studied by Jones is due to manufacturing maladjustments.

Hardening of Larger Sections

Of several series of tests the following are typical: Rolled or forged rounds, 5⅛ in. in diameter and 12 in. long, were held at heat 60 min. and quenched in water. They were then reheated to 900 deg. Fahr., held 2 hr. and furnace-cooled. Physical tests are summarized in the Rockwell C hardness as shown.

Steel			Quenching Temperature,	Hardness	
Carbon, Per Cent	Manganese, Per Cent	Nickel, Per Cent	Deg. Fahr.	Surface	Center
0.44	1.05	...	1475	33.3	19.3
			1525	34.2	24.0
0.48	1.09	...	1525	32.6	15.7
			1575	31.3	16.6
0.31	...	3.31	1475	38.0	27.0
			1525	36.6	25.7
0.41	...	3.02	1475	38.1	25.6
			1525	36.1	22.5

An examination of all the data shows that manganese steels compare very favorably with other structural alloy steels in ductility and impact resistance, when heat treated in heavy sections.

Disadvantage in respect to elastic ratio appears to grow rapidly with increase in cross-section above 4 in. Maximum hardness and depth of penetration are also not so good for manganese steels as for some of the more expensive alloys.

Machining Qualities

The manufacturer of the high-sulphur manganese steel contends it is suitable for cutting speeds higher than for open-hearth screw stock, and nearly as high as for Bessemer screw stock. To determine this point, rough-turning tests were made in the manner described by H. J. French and the author in *Transactions* of the American Society for Steel Treating, Vol. 2, 1922, page 1125. Results are shown on the chart printed herewith, which contains data secured on a similar manganese steel with normal sulphur (0.023 per cent), a carbon steel with 0.55 per cent manganese, and a nickel steel, all steels heat treated successively to two or more degrees of hardness and tensile strength.

It is shown by the figure that, in rough-turning, the cutting tool will perform about equal work prior to failure when cutting the higher-manganese high-sulphur steel and when cutting the 3½ per cent nickel steel, the comparison being based on equal tensile strengths. In a like manner the rough-turning properties of the lower-manganese steel and the plain carbon steel are comparable, and both produce more rapid failure of the cutting tool than do the first two steels mentioned. Whether this difference is due to sulphur or to manganese or both cannot be stated.

Miscellaneous Properties

It is generally recognized that pearlitic manganese steels are more resistant to sea water and most natural waters than are carbon steels. This has resulted in the use of much steel of about 0.35 per cent carbon and 1.35 per cent manganese for cast steel anchor chain. It has rendered exceptional service because of the combination of corrosion resistance, high strength and ability to sustain suddenly applied loads.

A. E. White and C. L. Clark have commented upon the ability of 1.5 per cent manganese steels to retain their strength properties at slightly elevated temperatures, and this has led to their employment for bolts in high-pressure steam lines. Exact data are still lacking to enable one to predict performance in this service.

Segregation in lower-manganese steels is to the direction usually encountered in carbon and many alloy steels, and to a degree comparable with that occurring in properly poured ingots. In higher-manganese steel made in the same plants, however, inverse segregation has been encountered, extremely pronounced in one lot of the high-sulphur product.

Heavier sections of cast steels containing 1.5 per cent manganese or more may show appreciable segregation and coarse dendritic formation. The latter are particularly persistent, and present a problem of some magnitude in the manufacture and treatment of these alloys.

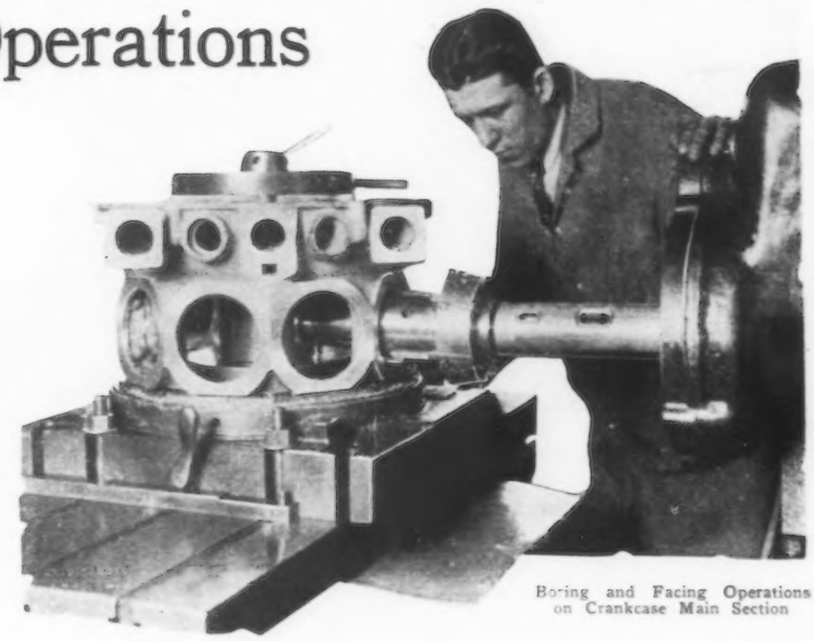
A hearing on the sale of the property of the Hydraulic Steel Co., Cleveland, will be conducted March 31 in the United States District Court in that city. Following the bid of $1,000,000 for the plant by the Truscon Steel Co., Youngstown, a bid of $1,525,000 was submitted by Lewis Levitt and Theodore Friedberg of New York.

The American Oil Burner Association, Inc., 350 Madison Avenue, New York, will hold its annual convention at the Hotel Stevens, Chicago, April 3-5.

Whirlwind Engine Parts Require Many Operations

Crankcase Sections Call for Expert Care in Molding—Eighty-Five Operations Needed to Complete Crankshaft

BY FAY LEONE FAUROTE*



Boring and Facing Operations on Crankcase Main Section

PRODUCTION of the crankcase, pistons, piston pins, valves, valve springs, and crankshaft of the Wright Whirlwind J-5 series airplane engine calls for the same careful handling, testing and inspection that characterized the manufacture of the cylinder and cylinder head of the engine, described in THE IRON AGE of March 1, page 590.

The crankcase is made up of five aluminum-alloy sections: Front section; intermediate section; main section; rear section; and the intake-manifold and oil-sump section. These crankcase parts, like the cylinder heads and pistons, are made in the Wright company's foundry. The alloy, however, differs slightly, the composition being: Copper, 10 per cent; nickel, 2 per cent; magnesium, 1.5 per cent; silicon, 1.5 per cent; iron, 0.75 per cent, and aluminum, 84.25 per cent.

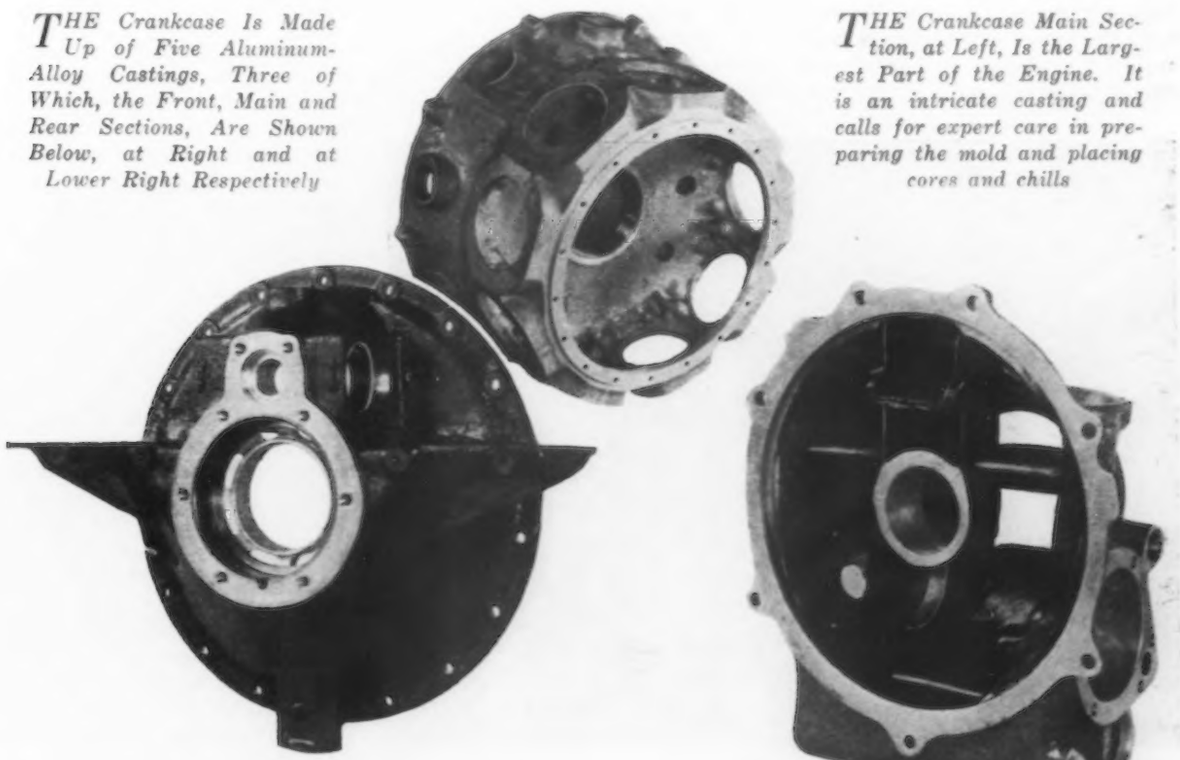
Crankcase Castings Made in Company's Foundry

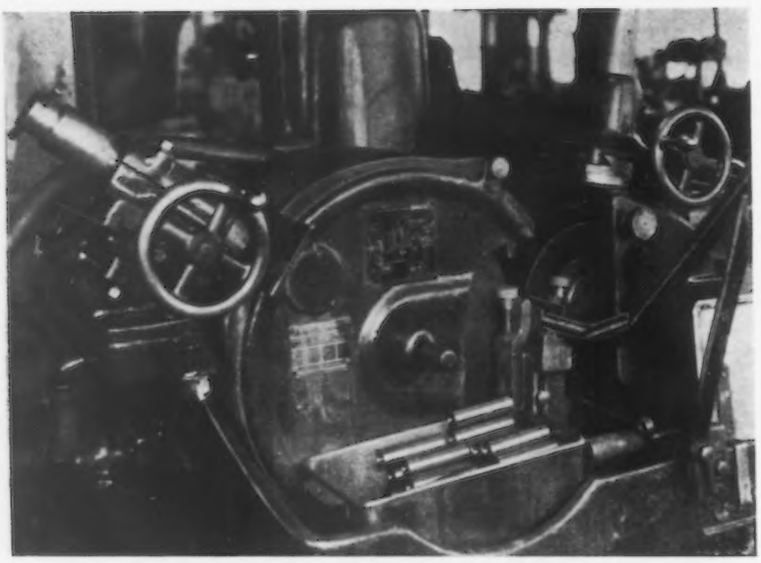
Because of the complicated character of these castings, special care is required in preparing the mold and placing the cores and chills. The sprues are very large, an excess of metal being used to assure homogeneity of the casting and to prevent blowholes by

*Mechanical engineer, New York, and former editor of the *Aircraft Yearbook*. This is the third and concluding article of a series on the Wright Whirlwind engine.

THE Crankcase Is Made Up of Five Aluminum-Alloy Castings, Three of Which, the Front, Main and Rear Sections, Are Shown Below, at Right and at Lower Right Respectively

THE Crankcase Main Section, at Left, Is the Largest Part of the Engine. It is an intricate casting and calls for expert care in preparing the mold and placing cores and chills

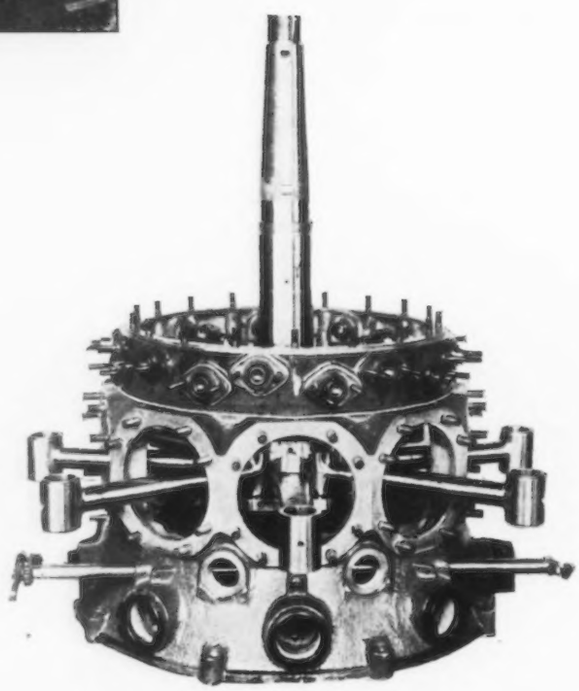




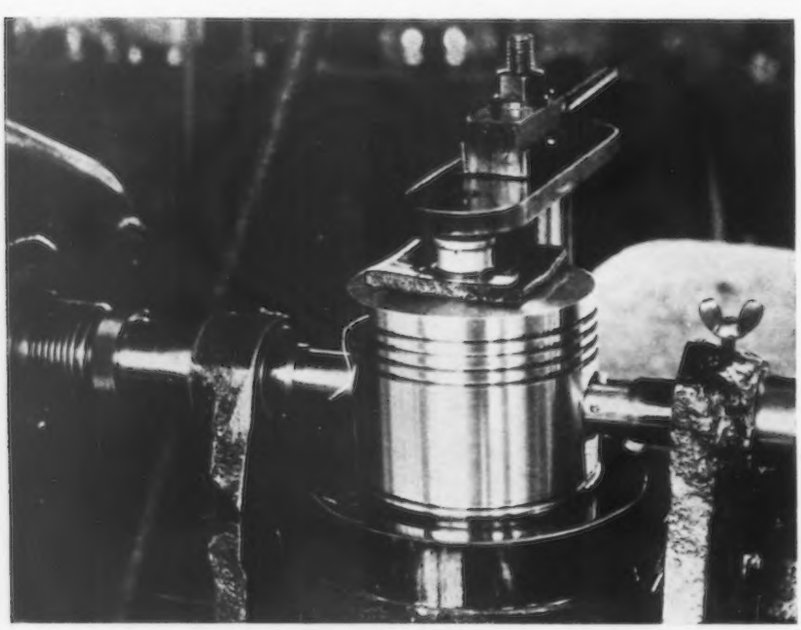
PISTON Pins, of Special Steel Tubing, Are Ground on Centerless Grinders, Which Make Five Passes, Removing Less Stock at Each Pass

giving the gas plenty of chance to get out. Air chisels and a power bandsaw are used to clean up the castings afterward. They are also thoroughly sandblasted, given careful inspection and a series of tests to determine their fitness. Since a portion of the interior of the crankcase is utilized as an intake header for the carburetion system, these passages are carefully cleaned and tested by applying air pressure of 70 lb. per sq. in. submerging the castings in water and looking for indications of bubbles. As in the case of a cylinder head the castings are next subjected to a specified heat treatment to relieve internal strains and to refine the grain. They are also submerged in an hydrochloric acid solution for about 20 min. in order that cracks, seams or other defects may be readily spotted.

A Bullard vertical boring mill equipped with standard tools is used to bore and face the ends of the main crankcase section. The bronze bearing ring is then inserted, and in addition to having a shrink fit it is anchored with a pin. The bearing ring is bored and the open end is faced on a vertical boring machine. Next, the nine cylinder flange holes, which are equally spaced around the circumference, are bored and faced on a horizontal boring machine, the work being held on an indexing fixture. Combination facing and boring heads are used. Then the nine intake-pipe bosses are bored and faced and tapped. Other small holes are drilled



CRANKCASE Main and Intermediate Section Assembled With Master and Articulated Rods and Valve Tappets



BORING Piston Pin Holes on Engine Lathe. During transit between machining operations the pistons are kept in individual containers

and tapped, with the exception of the cylinder stud hole in the nine cylinder pads. The eight holes in each pad are drilled on an upright drill equipped with a multiple drill head. After several more minor operations are performed the crankcase receives the usual final inspection and is then enamelled.

The other parts of the crankcase are treated in a similar way, and in addition to the usual turning and boring operations, they undergo a number of milling operations. The rear section has a number of oil passages in it; therefore, it has to be carefully machined and pressure-tested.

The 18 rocker boxes, nine exhaust and nine intake, are also cast in the Wright company's foundry from aluminum alloy, S. A. E. No. 30. This alloy contains from 7 to 8.5 per cent of copper. These small parts are, of course, of very thin section and require great care in machin-

EIGHTY-FIVE Machining Operations Are Required to Complete the Crankshaft. The balance weights are attached and turned in a lathe, exacting balance requirements being met

ing to prevent distortion. There are a number of drilling and milling operations on high-speed sensitive drill presses. Multiple-cutting and continuous-milling methods are also employed in later processes. Disk grinders finish the cover face. The parts are subjected to the same enamelling and baking process as the larger parts. The rocker box covers are punched and formed complete from sheet aluminum on a punch press.

The oil and the fuel pump parts, bearing retainers, and other small aluminum castings are also cast in the company's aluminum foundry. In this department many of the problems of weight reduction have been solved. A careful physical check and laboratory test to determine molecular structure, combined with rigid inspection and exhaustive pressure tests, insure good quality at all times; and a uniform run of good material free from the high percentage of defects many times found in such foundries.

Pistons Seasoned by Special Heat Treatment

The pistons of the Whirlwind engine are of an aluminum-alloy of the following composition: Copper, 4 per cent; nickel, 2 per cent; magnesium, 1.5 per cent; iron, 0.75 per cent; silicon, 0.5 per cent, and aluminum, 91.25 per cent. As in the case of the cylinder head they are seasoned by special heat treatment; an excess amount of metal is used to insure a clean interior. I was informed that some difficulty had been experienced in getting cutting tools which would operate satisfactorily on the pistons. After considerable research in cutting steels, a satisfactory method was found.

Before the "Y" alloy was used, the wristpin holes were bored with a boring bar carrying a diamond cutting point. This gave good results. But on the new metal this tool will not give smooth, true holes. Various high-speed and carbon steels were tried but without success. Finally, it was found that a chromium-plated tool gave the best results. I have been informed that the company has been broaching the wristpin hole and this method has greatly increased their production. An ordinary round broach fitted with detachable chromium-plated burnishing buttons on the end is now used.

In machining the piston the excess metal is first removed and the part subjected to a heat treatment to refine the interior structure. Boring the skirt or open end to a close dimension is the second machine operation, after which the piston is held in a special chuck locating the inside diameter of the piston. The skirt opening is bored concentric with the inside diameter within 1/64 of an inch. The sequence of operations then is: Drilling of the wristpin hole on a drill press; turning of the outside diameter; facing and centering the boss on the head; and rough cutting the ring grooves, which is done on a semi-automatic machine. The wristpin hole is then redrilled and the outside diameters are finish turned, leaving enough stock for grinding. The ring grooves are finish turned and burnished by rolling, after which the wristpin hole is

THE Piston Is of Y-Metal. Wristpin holes are broached with an ordinary tool having detachable chromium-plated burnishing buttons in the end

rough bored on a special horizontal machine. The pistons are then tested for leaks using hydraulic pressure. Following this the wristpin hole is broached and the outside diameters are ground. After finish facing the head and removing the working boss the pistons are inspected and weighed carefully. Wright requirements are met within close limits by reboring the skirt. Kerosene is used as a cutting lubricant for all finishing operations. The pistons are carefully kept in individual containers between operations and during transit.

Pins Quenched in Vertical Position to Prevent Warping

Piston pins are of special steel tubing bored and cut to length in automatic machines. They are heat treated, rebored in semi-automatic machines and then hardened. After the heat treatment in electrically-controlled gas furnaces the parts are quenched in a vertical position to prevent warping. Finally they are submerged for 20 min. in a 50 per cent hydrochloric acid solution to enable the inspectors to spot unsound sections and defects. The pins are ground on a centerlesss grinder in five passes, each pass making a smaller cut. The open ends are ground on an internal grinder to receive the wristpin plug. Afterwards both ends are squared up on a surface grinder. Finally they are lapped on the outside diameter within limits of 0.0002 in., on a production-lapping machine. Each pin is individually wrapped in waxed paper in preparation for final assembly.

The Wright valves are purchased outside to specifi-

VALVE Rocker Arm Housing, Valve Rocker Arm and Valve

cations supplied by the company and the product is checked by chemical and metallurgical tests in the plant. An additional treatment undergone by the exhaust valves is interesting. They are cleaned by dipping in gasoline and a boiling caustic soda solution, then immersed head down in a bath of chemically pure potassium nitrate kept at a temperature from 700 to 900 deg. Fahr. until bubbling ceases. They are then raised above the liquid and a ¼-in. diameter ejector rod, which has been preheated to the temperature of the bath, is pushed down until it strikes the bottom of the hole in the valve. The ejector rod is then removed and the valves taken from the bath and permitted to cool. The valve stem plugs are driven into the valve stem with an arbor press. The whole assembly is then washed and placed in the furnace where it is heated to 700 to 750 deg. Fahr. for 30 min. After cooling they are inspected for leaks, dipped into the 50 per cent hydrochloric acid solution at 180 deg. Fahr. and finally washed and inspected and placed in assembly cartons.

Valve springs, also made by outside specialists, receive careful inspection by means of electrical testing equipment. The intake valve guide is made of a special bronze alloy bar stock on an automatic machine. The exhaust valve guide is made from tungsten steel bar stock. Valve washers are made from bar stock on automatic machines and are hardened by a special cyanide process. The valve tappet guides are special steel forgings; the tappets are turned from bar stock drilled and cut off complete on an automatic turret lathe. Slotting is accomplished by a horizontal milling machine which cuts several parts at one time. The ball socket and push-rod balls are of special steel and are formed completely on automatic machines. These parts are hardened by a cyanide process and tested for hardness by a Rockwell machine using a diamond cone. The hardness range is from 64 minimum to 68 maximum. Next they are immersed in a nitric acid solution and examined for defects. Before hardening these parts, the ball ends are ground on a plain grinder using a special ball grinding device.

Crankshaft Requires 85 Operations

According to the operation sheet 85 operations are required to finish the crankshaft. It is received as a forging of special steel and a test piece is cut off and checked for physical characteristics. The shaft is first rough machined all over, placed in a 50 per cent hydrochloric acid bath for 30 min., inspected for defects and then finally finished, machined and ground all over. During the progress of the 85 operations of turning, milling, gun-drilling and grinding, two shafts are generally worked upon at the same time. Great care is exercised in the manufacture of this part as it is one of the most important components in the whole mechanism. Much depends upon its perfect balance and the balance weights which are attached and turned on a lathe are checked in a high-speed balancing machine until the exact balancing requirements have been satisfied. The balance weights are made of bronze and steel and are attached to the shaft by means of special bolts and screws.

Loading and Unloading Pipe by Magnet on Truck Crane

MUCH greater unloading speed is reported by the East Ohio Gas Co., Cleveland, through the use of a magnet instead of a hook block for pipe handling with a truck crane.

Unloading, stacking, rehandling and loading of pipe are all handled by this company by means of a Universal Crane Co. crane mounted on a 5-ton White truck. Formerly this crane was used with hook block and slings for such work, but recently this was changed by the installation on the crane of a 22-in. diameter, 230-volt pipe type of magnet, resulting in 60 per cent saving in time.

The photograph shows the truck crane unit loading pipe into trailers from stock piles. It is claimed that the following unloading speeds from railroad cars are averages for the crane and magnet unit:

1½	to 2 in. pipe,	3	hr. per car
3	to 4 in. pipe,	2	hr. per car
6	to 8 in. pipe,	1½	hr. per car
10 in. and over,		1	hr. per car

Total savings were greater than represented by just this unloading speed. After the magnet was attached there were two less men needed in handling 1½ to 4-in. pipe and four less men on 6 to 18-in. pipe. Another item of savings was less spoilage of pipe from ruining the threads or warping.

The magnet on this unit is excited by a generator mounted in the rear of the crane cab and driven by the crane gasoline motor. This makes the entire outfit completely contained and does not detract in any way from the mobility of the motor truck. With a mobile unit of this type the company has been able to serve several yards scattered throughout the city. For emergency jobs the crane can be sent at full truck speed.

USING the Magnet and Truck, Much Time Is Saved in Loading Pipe on the Trailer and in Unloading from Railroad Car

Testing Society Committees Confer

Large Attendance at Annual Group Meeting—Work on Stainless Iron and Alloy Steel Castings Inaugurated —Advances in Research and Specifications

ANNUAL group meetings of various committees of the American Society for Testing Materials have now become virtually a fixed policy of the society. The seventh meeting of this nature was held last week, March 21 and 23, at the Mayflower Hotel, Washington, and was one of the most successful and best attended of the series. Close to 450 members and visitors registered for attendance at the numerous gatherings of over 30 committees. Sessions of main and subcommittees were held morning, afternoon and evening of each day, the conferences being preliminary to the annual convention at Atlantic City, June 25 to 29.

These group meetings were initiated in the spring of 1924 at Pittsburgh. The second one met in Washington in the fall of the same year. In the spring of 1925 Philadelphia entertained the third meeting, while the fourth occurred in Cleveland in the fall of that year. Annual meetings were inaugurated in March, 1926, with a gathering at Providence, R. I. The 1927 sessions were held at Philadelphia last March. The features of most of these group meetings have been described in THE IRON AGE, and some of those of the sessions last week are here presented.

Metal and allied committees which were active last week were the following: A-1 on steel, A-2 on wrought iron, A-3 on cast iron, A-5 on corrosion of iron and steel, A-6 on magnetic properties, A-8 on magnetic analysis, B-3 on corrosion of non-ferrous metals and alloys, joint committee on phosphorus and sulphur in steel, and joint research committee on the effect of temperature on the properties of metals, as well as a few other minor groups. There was also a meeting of the cast iron research committee of the American Foundrymen's Association.

Progress in Steel Specifications

Attendance at the meeting of committee A-1 on steel Friday afternoon, March 23, was not so large as on previous occasions, and the session was comparatively brief. Minor revisions in several standards and tentative specifications were favorably acted upon. A note regarding the permissible overweight of plates ordered to thickness was approved for inclusion in standard specifications for structural steel for bridges, structural nickel steel, structural steel for buildings, and structural silicon steel. This note is the same as that which appears in the American Railway Engineering Association's general specifications for steel railroad bridges. The specifications for locomotives and cars were revised by the inclusion of the same note as embraced in the four standards just mentioned.

Specifications for Alloy Steel Castings

The specifications for carbon steel castings for valves were revised by the adoption of several revisions agreed to last year, but which were referred back to the committee at the annual meeting as a result of controversy over other revisions proposed at that time. The questions which were in controversy have been temporarily dealt with in another manner for settlement later. As a result of replies to questionnaires sent out to users of high-temperature and high-pressure equipment, the committee finds that there is not sufficient demand, nor are the practices sufficiently standardized, to warrant the preparation of specifications for materials for use at 1000 or 1200 deg. Fahr.

The subcommittee on steel castings, through one of its subcommittees, is engaged in determining the limits of physical requirements for alloy steel castings, which it is expected will lead to specifications. Definite requirements have not yet been fully agreed upon.

Progress is also being made in the preparation of two new specifications for alloy steel forgings, one for annealed and normalized forgings and the second for quenched and tempered forgings.

Interest in Cast Iron

Two important meetings were held on the subject of cast iron, one that of committee A-3 of the A. S. T. M., and the other the research committee of the American Foundrymen's Association.

New Light on Fatigue of Cast Iron

Attendance at the meeting of committee A-3 on cast iron was quite large. Considerable interest was manifested in the announcement of a paper on fatigue tests for the program of the annual meeting of the society in June, to be presented by J. B. Kommers, associate professor of mechanics, University of Wisconsin, Madison, Wis. This paper will cover results of testing nine or 10 sets of cast iron test bars received from various sections of the country. The complete results of tension, transverse, impact and fatigue tests, as well as chemical analyses and casting conditions, will be included.

Under the auspices of the committee there has been conducted during the last year an elaborate series of tests to determine the relation between the properties of specimens cut from iron castings and the properties of separately cast test bars from the same heat. These results, prepared by Jesse L. Jones of the Westinghouse Electric & Mfg. Co., Pittsburgh, will be included in the committee's annual report.

There was considerable discussion of the arbitration test bar and the tension test bar for cast iron, and progress was made toward advancing the specifications covering these to a further stage of development.

Research in Gray Iron

Under the chairmanship of J. T. MacKenzie, chief chemist American Cast Iron Pipe Co., Birmingham, Ala., a well attended meeting of the research committee of the American Foundrymen's Association was held Thursday morning, March 22. Some of the progress made by members of this committee in studying the fluidity and viscosity of gray iron was discussed. Work which is contemplated in studying the machinability and wear of cast iron was gone into quite extensively. Plans are also under way to investigate certain phases of the shrinkage of cast iron.

New Work in Magnetic Research

In the field of magnetic studies two important committees held meetings. At a session of committee A-8 on magnetic analysis, reports were received on several investigations now under way, the present studies of which will be outlined in the committee's next annual report, while in a subsequent report a more detailed summary will be given. A new investigation was announced which will involve a material other than that in use in the present investigations of high-speed tool steel.

In the field of magnetic properties committee A-6 at its meeting organized a new committee on tests at high magnetizing force, under the chairmanship of L. E. Howard. The scope and proposed activities of this committee were given very careful consideration. Last year the committee submitted an extensive list

of terms relating to magnetic tests of materials. This list has been reviewed and is now being revised and amplified.

Wrought Iron Committee Active

New specifications for iron and steel chain are being recommended by committee A-2 on wrought iron to supersede eventually the present standard specification.

The desirability of revising requirements in specifications covering the method of manufacturing wrought iron is being considered by a committee. Requirements now call for wrought iron made from "all-pig puddled iron," whereas wrought iron that meets the most exacting tests for high quality is being produced commercially by a radically different process without the use of a puddling furnace.

The committee is investigating the differences between the physical properties of rolled and hammered wrought iron forgings. Additional data are required. An investigation of the effect of phosphorus on the physical properties of staybolt iron is progressing. Several groups of samples have been furnished in which the method of manufacture and the chemical composition, with the exception of phosphorus, are as nearly as possible identical. These samples will be analyzed and tested physically in the annealed and unannealed state.

Progress in Joint Research

Two important joint research committees held sessions last week, one on the effect of phosphorus and sulphur in steel, and the other on the effect of temperature on the properties of metal.

Added Phosphorus in Steel Pipe

One of the most important matters brought before the joint committee on investigation of the effect of phosphorus and sulphur in steel, under the chairmanship of George K. Burgess, director United States Bureau of Standards, Washington, was the effect of phosphorus added to low-carbon steel. Suggestions had been made by the American Petroleum Institute that this matter be studied by the committee, and favorable consideration was given to these suggestions. The manufacturers of steel pipe also are interested in a study of this subject, particularly in the manufacture of welded pipe having a carbon range of approximately 0.06 to 0.12 per cent. The importance of such an investigation has been emphasized by the practice of rephosphorizing open-hearth steel of this grade to increase its machinability and strength without affecting its welding properties. It is believed that arrangements for procuring the steel can be effected, and it is tentatively planned to coordinate this research with tests of finished pipe from the same heats of steel, that will be made by the American Petroleum Institute. A program of tests of the material itself is being drafted and will be considered by the committee at its next meeting.

Regarding the study of phosphorus in steel castings, the committee on manufacture reported that the various materials had been produced and heat-treated and are now in the hands of the various laboratories for test.

How Temperature Affects Metal Properties

Many important phases of the study of the effect of temperature on the properties of metal were discussed at a well attended meeting of the joint research committee of the A. S. T. M. and the American Society of Mechanical Engineers. Further progress was reported concerning cooperative laboratory work, which has been under way for some time. Most of the short-time tests have been completed, and one laboratory submitted its report on flow test. An attempt will be made to coordinate results from short-time and flow tests. Satisfactory arrangements being assured, it is expected that laboratory work on fatigue at elevated temperatures and thermal conductivity will be under way in the near future.

Work on Corrosion of Iron and Steel

In the corrosion of iron and steel, committee A-5 on this subject at its meeting reported that several specifications for zinc-coated products had been prepared or had been under consideration during the past year. New specifications are being issued covering zinc-coated barbed wire and zinc-coated steel wire strand. A sub-committee has been at work formulating methods of test of an accelerated nature in an attempt to get results in a short time, which will indicate serviceability of materials in various classes of service. Some of the suggested methods have been carefully considered and are approaching the stage of actual value.

Stainless Steel Alloys to Be Studied

Important action was taken by the joint advisory committee on corrosion, whose chairman is W. H. Bassett, technical superintendent American Brass Co., Waterbury, Conn. This committee is an administrative one, consisting of appointed representatives from the two A. S. T. M. corrosion committees, A-5 on iron and steel, and B-3 on non-ferrous metals and alloys. Its function is to correlate the activities of the two committees and particularly to advise the executive committee of the society in matters relating to new fields to be entered.

At the meeting last week a proposal was considered which had been made to form a committee of the society to study a group of corrosion-resistant alloys which lies between the fields at present being developed by the two committees. An enlightening and valuable discussion developed, which crystallized in a recommendation to the executive committee that it form a new standing committee in the society to study the alloys of the iron-chromium-nickel system, the committee to have adequate representation from both producing and consuming interests and to function under the scope which would include studies of all properties of the alloys in this system.

On Thursday evening, March 22, an informal dinner was held, at which over 100 were present. Two prominent Government speakers delivered addresses after the dinner: Hon. William P. MacCracken, Jr., Assistant Secretary of Commerce for Aviation, and Admiral H. H. Rousseau, in charge of Naval oil reserves. Several inspection trips to the Naval Gun Factory, the Bureau of Standards, the Bureau of Chemistry and other Government institutions were taken advantage of by various members under the direction of the local entertainment committee, of which Jerome Strauss, Naval Gun Factory, was chairman.

"Forward Atlanta" Campaign Takes 309 Companies to That City

The Forward Atlanta Commission of the Chamber of Commerce of Atlanta, Ga., has distributed a booklet summarizing the results of the two-year campaign to promote that city commercially and industrially. Within the period that the community-promotion campaign has been in operation 309 new companies have located in Atlanta, 9158 new jobs have been created and $14,919,350 annually in new payrolls has been added. Atlanta is now regional headquarters for more than 900 of the country's leading manufacturers. George West, chairman Forward Atlanta Commission, says: "Atlanta's success should be an inspiration to all cities that may today be working toward a similar movement."

Financial Executives' Conference in New York, April 26 and 27

The fourth financial executives' conference of the American Management Association will be held at the Hotel Pennsylvania, New York, April 26 and 27. Among the subjects to be considered are "Trends in Corporate Finance," "Operating the 13-Month Work-Calendar," "Technique of Costing Marketing Activities," "Organizing, Financial, Accounting and Related Functions" and "Trends in the Composition of Boards of Directors." The salary administration group of the association will hold a round table conference at the same hotel on Saturday morning, April 28. W. J. Donald, 20 Vesey Street, New York, is managing director of the American Management Association.

British Institute Considers Brass

Cause of Blowholes, Hardening After Heat Treatment, Forgeability, and Corrosion in Sea Water Occupy Institute of Metals

LONDON, March 8 (*By Mail*).—Dr. Walter Rosenhain, chief of the metallurgy department of the National Physical Laboratory, and president of the Institute of Metals, occupied the chair at the annual meeting of the institute, which opened yesterday. The council's report reflected the continued progress of the institute, whose membership has increased to 1903, including 700 overseas members resident in 41 countries. The international character of the institute is incidental rather than fundamental, but the members realize that the advancement and development of their own science can achieve its full measure of success only if it is carried out in cordial cooperation with the able and successful workers in other countries.

Copper Hardened with Beryllium

In his inaugural address, Doctor Rosenhain pointed out that although he is regarded as a scientific worker rather than a practical man he attached the greatest importance to practical papers and to the interchange of ideas and knowledge between practical men and scientific workers engaged on similar subjects. He hoped that the mutual understanding might be extended also to the business men who control the finance of the non-ferrous metals industries and who are therefore the deciding factor in determining how far and how soon the results of research are to be utilized.

Some may think that the number of equilibrium diagrams described in the *Journal* of the institute is too large, but he pointed out that the formidable term "equilibrium diagram" merely means that the diagram represents those conditions which the alloys tend to assume if they are allowed to attain their final condition of balance. As an example of the need of great accuracy and completeness in the study of these diagrams, an account was given of the method of determining the "solid solubility lines" of various alloy systems. These determinations, which at first sight appear to yield results of purely academic interest, have not only furnished the explanation of the age-hardening of duralumin and other aluminum alloys, but form the foundation for a series of new and important alloys of copper and other metals. In some of these, notably the alloys of copper and beryllium recently developed in Germany, the age-hardening effects are very large. An alloy containing only a small percentage of beryllium could have its hardness raised from 80 to 410 by age-hardening, the tensile strength in the latter condition being of the order of 200,000 lb. per square inch.

Heat Treatment of 60 : 40 Brass

A study of rolled brasses containing from 55 to 63 per cent copper was made by T. Matsuda of Sumitomo Steel & Copper Works, Osaka, Japan. He finds that the Brinell hardness as rolled and furnace-annealed (varying from 92 for the 55 per cent copper brass to 56 for the 63 per cent copper) remains unchanged until the quenching temperature passes the transformation range where the alpha constituent dissolves in the beta. Quenched from the beta range, the brasses attain a uniform hardness of 100. Slower coolings from the beta range give intermediate hardnesses, depending upon the amount of the alpha constituent which can separate. The highest hardness he was able to prepare by heat treatment is in a 60 : 40 brass, quenched in water from above 800 deg. C. and tempered at 300 deg. C. for 30 min. This gave the following physical properties:

Tensile strength	70,400 lb. per sq. in.
Elongation	22 per cent
Brinell hardness	127
Stanton impact number	5,835
Izod impact energy	17.9 m.-kg.

Strength and hardness curves, plotted against annealing temperature, show a sharp peak at 300 deg. C., this corresponding to the precipitation from the solid solution of alpha crystals of critical size for maximum slip interference.

Soundness of 70 : 30 Brass Ingots

Presence of rounded cavities in cast brass has been ascribed to the evolution of dissolved gases just before solidification, and various experimenters have reported the extraction of comparatively large volumes of gas from the solid alloy. In order to determine whether melts previously saturated with gas had undue porosity on solidification, G. L. Bailey, metallurgist in the research department, Woolwich Arsenal, cast a series of small round ingots, 6 in. high and 1½ in. in diameter, with hot tops. Each cast was made in four molds, as follows:

Mold	Temperature (Degrees Centigrade)	Blackening	Approximate Solidification Time (Seconds)
Thick-walled copper	100	Soot	16
Thin-walled cast iron	100	Soot	22
Calorized steel	800	None	145
Dry sand	100	None	310

By preliminary experiments with a 5-per cent tin bronze (especially difficult to cast sound) it was determined that nitrogen, bubbled through the melt when held in a carborundum-lined electric furnace, is able to sweep out substantially all the dissolved gases, and any porosity on solidification is then due to shrinkage cavities.

This determined, 70 : 30 brass was then melted in the electric furnace and treated at temperatures corresponding with the limits of good foundry practice. First nitrogen was bubbled through it for 20 min. at 1100 deg. C., and a set of ingots was cast. Another melt was bubbled at 1050 deg. C., and cast from 1000 deg. C. A third was treated similarly, but was heated after bubbling to 1140 deg. and then cooled in the ladle to 1000 deg. C. This program was repeated with hydrogen and with sulphur dioxide, the two supposed offenders causing gas cavities. After the sink head was cut off, porosity was determined by measuring the specific gravity and comparing it with that of the alloy solidified in a vacuum, rolled and annealed.

The various temperature programs made no differences in the amount of voids, within the limit of experimental accuracy. Voids produced by the gases were as follows (in per cent):

Time of Solidification	Nitrogen Saturated	Hydrogen Saturated	Sulphur Dioxide Saturated
16	0.39	0.20	0.61
22	0.41	0.19	0.66
145	0.59	0.18	1.12
310	3.28	3.40	3.31

From these figures, and from the results of microscopic examination, Mr. Bailey concludes that 70 : 30 brass is not liable to unsoundness caused by gases, whatever the conditions of casting. Slow speeds of cooling, as in dry sand, are associated with much more pronounced shrinkage cavities than after casting in metal molds. Spherical cavities of varying size and unequal distribution frequently found in brass ingots are, in his opinion, caused by mechanical entrapping of gases within the mold; any gases actually in solution in the liquid metal just before freezing are retained in the solid without blowhole formation.

Testing Brass for Forgeability

Since it is well known that the ordinary physical tests do not indicate the forgeability of metal, W. L. Kent of the University of Birmingham studied the action of hot pellets, struck by a single blow of a drop hammer. He regards the amount of flattening as being a rough measure of forgeability.

A single blow reduced pure copper at room temperature 15 per cent. Reduction increased steadily with

rising temperature, until it reached 28 per cent at 800 deg. C. Above that the malleability increased very rapidly. Brinell tests taken on the flattened pellets after cooling showed that the cold copper (which was originally 43 hard) measured 70 after one blow, and this hardness decreased uniformly with the temperature of forging until at 500 deg. C. a hardness of 67 was reached. Recrystallization is rapid in the range 500 to 650 deg. C., so that the hardness of pellets struck once and cooled is about 43 if the work is done at any temperature above 650 deg.

Both pure and leaded 70 : 30 brass were tested similarly. Malleability increases very little from room temperature (reduction 15 per cent under single blow) up to 700 deg. C. (reduction 18 per cent). Above that the increase is rapid. Hardness is maintained at about 92 after all impacts up to 400 deg. C. Decrease is then uniform with temperature, reaching 54 after cooling from one blow at 900 deg. C. Originally these pellets were 54 hard. The presence of lead causes no change in these figures. However, the leaded brass developed intercrystalline cracks when tested at 350 deg. C. and above.

Sixty-forty brass (Brinell hardness 70) deformed 12 per cent when struck once at any temperature up to 400 deg. C., from 400 to 650 the malleability increased gradually to 23 per cent, and quite rapidly thereafter. Hardness of pellets cooled after testing sagged from 103 (100 deg.) to 85 (550 deg.) but increased to 92 after testing at 850 deg. C., where the brass is all in the beta phase. The lead-free samples forged well up to 650 deg. C., but had marked side cracks after testing at higher temperatures, a condition opposite that for the leady brass. This corresponds with rolling mill experience.

A study of the results convinces the author that this test will indicate whether a certain material can be forged at a given temperature without cracking and its relative forgeability at various temperatures. The best temperature for working can be discovered with the further aid of a series of Izod impact tests on hot samples. In interpreting the results it should be borne in mind that strain hardening occurs during hot work as well as during cold work, and the amount of work which can be done by successive blows or rolling mill passes will depend upon whether the temperature is high enough to cause rapid recrystallization, or to soften the metal even though it does not recrystallize.

Corrodibility of Metals in Sea Water

Four years ago, a rack containing 50 bars (1⅛ in. in diameter, 2 ft. long) of various alloys was fixed to the sea bottom at lowest tide in the Bristol channel. After four years' continuous exposure to sea water, they have been examined by Prof. J. Newton Friend, of Birmingham Technical College, and given the following rating, the first mentioned having the highest order of merit:

1. Ingot tin. Cast bars became dull colored, freckled with minute white dots, appearing to be centers of incipient pitting.

2. Rolled Mond nickel. Lost 0.44 per cent in weight. It was originally covered with hot mill scale, and most of this remained after four years' exposure. Very minute pits were numerous.

3. Lead, both commercial soft lead, and an alloy with 1.6 per cent antimony, extruded. These had been bruised by stones dashed against the rack during storms. The surface was dull, and in some places hidden by a white deposit, easily rubbed off. These bars lost about 0.6 per cent in weight, thus being inferior to tin.

4. Screw stock (Cu : Zn : Pb 60 : 38.6 : 1.4). It was covered with a smooth pale green coat without eruptions, (which classes it above the nickeled copper described below). It had uniform, small-sized crystalline grain. It lost 3.8 per cent in strength and 1.4 per cent in weight.

5. Copper with 1.8 per cent nickel. Dull brick-red in color, with a scattering of small green excrescences. The diameter of the bar had been reduced 1.4 per cent, and the strength, an equal amount.

6. Copper. Both ordinary (99.8 per cent) and arsenical, in cold-drawn bars, developed far more and larger excrescences than the above. These proved to be caps to portions of slightly elevated metal. The diameter of the bar was reduced by 2.4 per cent, and the strength, about 4.5 per cent. The entire freedom from pits is noteworthy.

7. Nergandin brass (Cu : Zn : Pb 70 : 28 : 2). Similar in appearance to 5 above, although the coating tended toward greenish. At the ends, where the bars had been fixed in the wooden frame, considerable erosion had taken place. Loss in weight was 5 per cent; loss in strength, 6.1 per cent. Microstructure is essentially alpha brass, and while the loss in weight is heavy, it was uniform and showed no tendency to develop pits. The lead content appears to prevent pitting.

8. Naval brass (Cu : Zn : Sn 62 : 36.7 : 1, with 0.2 lead). Covered with a smooth, tight coat of greenish-ocher color, marked with a number of flat wart-like excrescences, representing filled-in pits where dezincification had proceeded. The diameter of the bar was reduced 3.1 per cent, and the strength, 4.8 per cent. In the development of this composition tin was introduced in order to check the decay frequently noted in Muntz metal, and appears to increase the tenacity with which the protective coat clings to the metal. If naval brass is situated where this coat is scoured off by mechanical action, its corrosion rate will probably be on the same order as Muntz metal.

9. Muntz metal (Cu : Zn 61 : 38.7 with 0.4 lead) had a thin pale green coating, thickly studded with warts. As in the naval brass, these warts were metallic, consisting of copper replacing the beta constituent. The extent of the action is measured better by the loss in strength (9.4 per cent) than by the reduction in diameter (1.4 per cent). Rate of corrosion in Muntz metal will vary if it is in contact with other metals; it also depends on the surface condition of the newly made metal—the cold-worked surface being more resistant to sea water than the underlying metal free from strain hardening.

10. Commercial zinc in rolled bars, (1.1 per cent lead). It was covered with small dome-shaped excrescences of brittle material, so closely attached to the metal that it could not be removed. The bar appeared to be covered with pits nearly 1 mm. deep, which are responsible for its low rating. Loss in weight was 4.7 per cent; loss in tensile strength, 10.3 per cent.

11. Aluminum (99.4 per cent). Corroded very deeply at the ends, where it was embedded in putty. The rest of the bar was covered by a stone-colored layer, broken by pits up to 6 mm. deep, thus penetrating nearly 20 per cent of the diameter. The loss in weight was only 4.5 per cent, although the tensile strength was reduced 16 per cent. It is believed that these pits result from cracks or fissures in the primary oxide skin on the freshly manufactured bar, rather than from segregated impurities or localized differences in metallic structure.

Baldwin Plant in Canada to Make Seamless Tubing

TORONTO, ONT., March 27.—Arrangements have been effected by which Page-Hersey Tubes, Ltd., will take over the plant of the Canadian Baldwin Corporation, Ltd., at a price said to be $500,000.

The official statement issued after a meeting of the Page-Hersey board of directors, was as follows:

"The Baldwin Canadian Steel property has been merged with Page-Hersey Tubes, Ltd., and its works will be utilized for the manufacture of seamless steel tubing and kindred products.

"The Page-Hersey Co. is the largest manufacturer in Canada of what is known as wrought iron and steel welded pipe, but the demand for seamless pipe is growing rapidly and the merger allows them to enter this field under advantageous conditions, as the Baldwin plant is well suited for the industry and the location particularly good as a manufacturing and distributing center.

"The combined enterprise will be in a position to supply a complete line of steel and wrought iron pipe of all grades, both for domestic and foreign markets, and will consequently effect important savings in manufacturing and sales costs, which, as separate units, they could not enjoy.

"No new issue of securities is contemplated."

Schwab Testifies in Coal Hearing

Chairman of Bethlehem Steel Corporation Recommends Hegira of Surplus Labor from Bituminous Fields—Says Repeal of Sherman Law Would Not Help Coal

WASHINGTON, March 27.—The application of the law of supply and demand as a means of solving the ills in the depressed bituminous coal industry was suggested by Chairman Charles M. Schwab of the Bethlehem Steel Corporation to the Senate Committee on Interstate Commerce when he, together with John D. Rockefeller, Jr., and R. B. Mellon, appeared as witnesses last Friday in connection with the inquiry the committee is making into conditions in that industry. Testifying freely, Mr. Schwab at times spoke in a lighter vein but when serious questions arose he became earnest in his remarks and frequently displayed strong determination in supporting his views.

Except for the coal industry, Mr. Schwab told the committee, labor conditions in the United States are "happily prosperous," and he emphasized the need of mutual understanding between employer and employee as the real basis of the solution of the coal problem. He pointed out that laws of supply and demand are unchanging and must be recognized in coal as in any other industry. Disclaiming first-hand knowledge of conditions in the bituminous coal fields or operating conditions of the subsidiary mining properties of Bethlehem, Mr. Schwab gave views concerning relations between employer and employee and discussed labor conditions in the steel industry. Full cooperation was promised by Mr. Schwab in solving the coal problem and he agreed to join any conference toward that end.

Settlement must be found in a natural way, Mr. Schwab said, and sensational charges by employers and employees alike must be avoided. He asked the committee and counsel for the United Mine Workers not to take an antagonistic attitude toward him and was told there was no desire to criticize adversely, a statement which appeared to please Mr. Schwab.

Excess Mining Labor Should Go Elsewhere

Mr. Schwab told the committee that a two-fifths oversupply of labor in the coal industry must not be disregarded and recommended that this surplus of labor be encouraged to direct its efforts elsewhere. He suggested that a wealthy man could do a monumental social service by financing an hegira of the excess labor from the coal fields. He also declared that combinations of units for the sake of economical operation must be permitted by the Government. It was pointed out that it is a great economic waste to the country to have 500 mining companies operating where there perhaps ought to be 10. Mr. Schwab asserted that the depression in the coal industry might possibly be due to the efforts of President John L. Lewis of the United Mine Workers Union to maintain wages at too high levels in the face of economic conditions. Mr. Lewis, with whom Mr. Schwab had shaken hands before taking the stand, replied to Mr. Schwab, declaring that "the lowest, most unfortunate wage earner in the West Virginia coal fields should not be used as the yardstick for measuring the wages of workers throughout the industry." He also insisted that if union wages were lowered the non-union wages would likewise be lowered.

Considerable questioning of Mr. Schwab concerned the Bethlehem Mines Corporation and the Ellsworth Collieries, a Bethlehem subsidiary, but Mr. Schwab said he had no knowledge of alleged degrading conditions in these or any other Bethlehem company. He promised, however, that he would make a personal investigation. Senator Wheeler, Democrat, asked Mr. Schwab about the alleged abrogation by the Bethlehem Mines Corporation of the Jacksonville agreement.

"I don't know anything about it," relied Mr. Schwab, "but I never would admit that our company abrogated any agreement."

He declared that the mines would be shut down in preference to violation of an agreement if that were the only means of preventing loss of money.

"My course has been to follow the highest moral and business integrity that is possible and I cannot believe that our people violated this agreement," said Mr. Schwab.

When Senator Wheeler declared that the public required protection from huge industries, Mr. Schwab replied by saying that the United States Steel Corporation did not earn 6 per cent on its investment last year.

Repeal of Anti-Trust Law Only a Palliative

As the inquiry proceeded, Chairman Watson, Republican, of the committee said: "We're seeking here a remedy for a manifest evil in the coal industry. Do you think the Sherman Anti-Trust Law should be repealed to enable the coal operators to fix prices to help the miners and to guarantee a fair profit to the investor?"

"I do not," replied Mr. Schwab. "That remedy would be a palliative, and would not alleviate the present serious condition."

Getting back to the Ellsworth mines of the Bethlehem Corporation, a verbal tilt arose between Senator Gooding, Republican, and Mr. Schwab when the former criticized Mr. Schwab for not being familiar with conditions in those mines.

"You don't know about some conditions in your own house, do you?" Mr. Schwab inquired rather sharply, but in a tone not unmixed with humor.

"I know that," admitted Senator Gooding, as the audience broke into loud laughter.

The attitude of Senator Gooding toward Mr. Schwab became cordial and he declared that "if every man employing labor were a Mr. Schwab we would not have the present condition, but unfortunately that is not true."

Attorney Eaton, representing the miners' union, quizzed Mr. Schwab about conditions at the Ellsworth mines and finally drew a remonstrance from Mr. Schwab. The latter declared he had come to Washington "with my heart filled with a desire to do anything to help, but your questions are not strengthening the conviction in that heart. I would work harder than you or any one at this table to correct conditions that are wrong."

Artificial Labor Conditions Cannot Be Helpful

When he turned to general questions of labor policy, Mr. Schwab asked for and was given permission to make a statement on that subject, based on an experience of 40 years in labor management, "during which, I say boastfully, I have never had a serious labor difficulty." Insisting that all great economic questions of labor rest on the old theory of supply and demand, Mr. Schwab said that the creation of any artificial condition with reference to labor and industry cannot be sound and helpful. There must be, he said, a true, complete and thorough understanding.

The method of the Bethlehem Steel Corporation, Mr. Schwab explained, is to have all labor questions debated in conference with the management, each 300 workers electing representatives who meet once a month or oftener with the management. In the event the conference is unable to settle a question it is left to arbitration, Mr. Schwab told the committee, the Secretary of Labor of the United States being the arbiter.

In 10,000 or more questions, Mr. Schwab said, not once had arbitration been necessary.

"The result is that we take the employee completely into our confidence," he continued. "When we meet, we give them all the information that we would give our stockholders. We have had reductions in wages, and when the workingmen understand the reasons there are no complaints. On the other hand, we have had more advances, due to prosperity in the industry." Mr. Schwab said the average earnings of all employees, exclusive of executives, are now 63.8c. per hour, and asserted he was proud of that average in view of the great number of unskilled workers in the industry. Direct contact with the men was called "human engineering."

"But we know we can't have the heart of our men in the business unless they are part of it," Mr. Schwab stated. "The most important stockholders in the Bethlehem Steel Corporation are the men. They own from one-fourth to one-third of all the preferred stock, amounting to about $37,000,000." Of this, he said, about $3,000,000 worth is held by miners.

In the mines, Mr. Schwab declared, the same development of employer-employee relations has not been possible, but he expressed the hope that he could bring about the same condition in the coal properties as in the steel industry. Coal has presented so many difficulties, he said, that "nobody would be happier to get out of the mining industry than the Bethlehem Steel Corporation."

Never Made a Dollar Out of Bethlehem Steel Co.

He told the committee that he had never made a dollar out of Bethlehem Steel, that he was not now working for money, had no sons or heirs to whom to leave his fortune and that he spoke as one who hoped to leave as a monument to his efforts the humanization of industry.

He was asked by Senator Watson if he believed in collective bargaining.

"Collective bargaining," replied Mr. Schwab, "is a bad term; it is understanding with each other that I'd prefer to call it. Mr. Lewis remembers that the greatest autocrat in industry was the sub-foreman, against whom a workman was afraid to complain. With understanding, the worker can come forward with his grievances, and the result is that everybody is happy."

When Senator Gooding declared that the coal and steel industries could not be compared, Mr. Schwab responded that they ought to be exactly alike and that "so far as our mines are concerned, that's the way we intend to operate them."

Mr. Schwab disagreed with Senator Gooding when the latter said he could not concede that wages should be made subject to the law of supply and demand, adding that he believed there was not enough employment in the country for its increasing population. Mr. Schwab declared that the steel industry is far from its saturation point. The United States, with 5 per cent of the total population, said Mr. Schwab, does 50 per cent of the world's manufacturing. He asserted that industry in this country is "still in its swaddling clothes." Mr. Schwab said that the average employer is glad to have his workers make money, adding that the average earnings have increased year by year until last year they were the highest in history. The Government can help only if it will give capital a chance to operate its business economically, said Mr. Schwab, who stated that the Government has not been successful in the supervision of business.

Deplores Waste in Steel Distribution

Mr. Schwab discussed the steel situation at considerable length. For one thing, he expressed the view that Federal laws prevent economies which might well be applied to steel distribution. In replying to Senator Couzens, Republican, of Michigan, formerly associated with Henry Ford, Mr. Schwab said that the things that would give profit to the manufacturer are the things that Washington has prevented the manufacturers from doing. For example, he stated, the Bethlehem Steel Co. ships steel to Chicago and to other points where there are steel works, while Chicago, through the United States Steel Corporation, ships steel to places in the East where Bethlehem has steel works. That was declared to be economically wasteful and unsound. He explained to Senator Wheeler, Democrat, of Montana, that it is contrary to the law of the land for the steel manufacturers to have an understanding with each other as to where they will sell their steel, but that it would mean a great deal more money for the workingmen of the country if Congress would pass sane laws permitting business men to conduct their business in the most economical manner.

"Now let us do some such thing in our business and we will earn a return on our capital," said Mr. Schwab. "The steel industry in the last year, with $8,000,000,000 of capital invested, did not earn more than 5 per cent on the money invested."

Mr. Schwab said he was not criticizing the laws but the conditions, and Senator Wheeler declared that he believed in Mr. Schwab's theory.

Senator Couzens, who was somewhat critical of some of Bethlehem's policies as to labor, told Mr. Schwab that the latter had "a very idealistic plan of cooperation with your workmen," but pictured a condition where he might be competing in a nearby coal field with Mr. Schwab and if he offered the coal at less money than Mr. Schwab did it was apparent that the latter would have to revise his plans "every once in a while." Mr. Schwab said that the plan is operated in the steel industry successfully, whereupon Senator Wheeler replied that the steel industry is controlled practically by two or three great concerns.

Reduces Steel-Making Costs but Gives It Away

"No, by no means," Mr. Schwab responded. "We have 18 or 20 big companies in the United States and more than 100 companies. For example, I showed my own directors the other day where we had spent $90,000,000 the last three years to reduce our cost $6 a ton, and yet we were selling our steel at $8 a ton cheaper than we were three years ago, but despite all that the wages of the workmen have gone up year by year."

Senator Couzens insisted that it is obvious that the United States Steel Corporation practically dominates the market, but Mr. Schwab said he did not know that, though agreeing that the small steel producer cannot compete with the United States Steel Corporation or any other big producer.

Earnings of steel producers were discussed at some length, Mr. Schwab stating the United States Steel Corporation did not make 6 per cent last year on its investment of something like $2,500,000,000. Senator Wheeler suggested that in the past steel companies made money.

"But those were days when you permitted us to have pools and agreements to get good prices for our steel," said Mr. Schwab. "We cannot do that today." He told Senator Wheeler he did not think it was necessary for the Government to "step in" to prevent those things because "you have had the cheapest steel in the world during all of these years. The steel industry as a whole has never earned big returns on the money invested, and I know of no industry today, excepting coal—and that is a part of the steel industry—that is earning as little on the actual money invested as the steel industry."

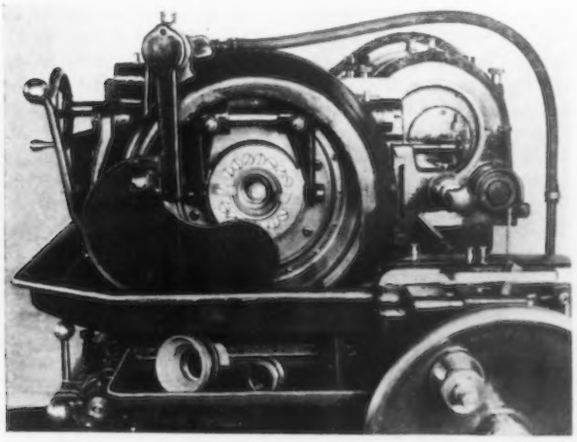
"Fifty years ago I started in the steel industry when this country was believed to have reached its zenith with 10,000,000 tons production per year," said Mr. Schwab. "Every year in the succeeding 50 years I have advocated spending money for the enlargement of our industry. Today the steel industry is producing 50,000,000 tons a year. We think we are near the saturation point, but, as a matter of fact, I think we are only just beginning. And so strong am I in that conviction—and there is no conviction so strong as that which a man is willing to back with his money—I say so strong am I in that conviction that the Bethlehem Steel Co. is spending from $30,000,000 to $40,000,000 every year for the extension of its business. I am as fully convinced now as ever that we will have just as great an advancement for the industry in this country in the next 50 years as we have enjoyed in the past 50 years."

NEW INTERNAL GRINDER

Grinding Wheel Enters Work from Rear—Work Spindle Arranged to Eliminate Overhang

AN internal grinder which incorporates departures from the usual design and which is claimed to establish new standards in production, accuracy, safety, and compactness is being placed on the market by the Greenfield Tap & Die Corporation, Greenfield, Mass. The machine is designated as the No. 12 Hydro-Matic.

An outstanding departure is in the use of an unusually large hollow work spindle through which the grinding wheel travels, thereby approaching the work from the rear. This, it will be noted, is a reversal of the usual practice in which the grinding wheel enters the work from the front. As in other internal grinders made by the company, the work-head which is mounted upon the table is reciprocated by means of oil under pressure, thus giving an infinite number of feeds.



A Departure Is the Hollow Work Spindle Through Which the Grinding Wheel Travels, Approaching the Work from the Rear. The wheel-head is at no time exposed

Since the wheel-head is stationary, and enters from the rear, it is at no time exposed. When the work-head is in the loading or unloading position the wheel is back out of the way, practically out of sight, and completely protected. The operator is thus in no danger of coming in contact with the wheel and can give his entire attention to loading and unloading the work. It is pointed out that in not having his movements circumscribed because of the danger of a rapidly revolving wheel, the operator can work faster and more effectively. It should be noted that the operator's position is at the front of the work instead of at the side, the advantage of which position is further enhanced by the arrangement of the levers all of which are located at the front end of the machine, facing the work, and within easy reach from the normal working position.

Further advantages claimed for the arrangement of the wheel-head is that the wheel is entirely inclosed; the coolant floods the work, interior of work spindle, truing device and wheel spindle at all times, maintaining a constant temperature and preventing the slight expansion and contraction of the mechanism which may cause inaccuracy of the finished product.

Sizing is by means of a semi-automatic device of new design. Automatic action of the feed screw is governed by a cam arranged so that successive strokes of the table result in progressively diminishing increments of feed. Upon the completion of roughing cuts a convenient lever serves to pass the diamond over the face of the wheel in preparation for the finishing cut. Definite and predetermined increments of feed are taken after the wheel is trued for the finishing cut, which increments, in being governed by the positive action of a cam, will not vary. The diamond is in a fixed position at all times, which arrangement is intended to eliminate minute variations which it is said may occur when a diamond is moved in and out of a fixed position.

Advantages claimed for the cam feed with its diminishing increments are that the heavier roughing cuts are taken with a clean, sharp wheel. As the wheel dulls or becomes loaded, less and less strain is put upon it, thus minimizing the tendency of the spindle to spring under pressure and grind bell mouth. Truing of the wheel just before the finishing cut removes the dulled or loaded surface and assures an accurate mirror-like finish.

Instead of mounting the work spindle in two relatively small bearings, in which minute inaccuracies might be amplified by the crank action of the spindle, the work spindle of the machine illustrated runs in an unusually large bearing and is arranged so that the work is practically inside of the bearing. It is pointed out that in this construction misalinement of the bearing is minimized. It is stated that the result of the improved design is that the machine will grind on a production basis to limits of 0.0002 in. to 0.0003 in.

Since the machine is primarily for production purposes it is regularly furnished with one work-head speed. Other speeds are available through change gears located at the end of the machine. Ball bearings are employed throughout, including hand-operated shafts.

Compactness is a feature of the grinder. Operation of the machine is entirely mechanical and has no electrical contacts. The present size machine grinds holes ranging from ¾ to 3 in. in diameter, 4 in. in depth. The work-head swivels for taper grinding. For motor drive only one motor is employed, and when arranged for belt drive, there is only one belt, which operates directly from the lineshaft to a clutch pulley on the machine. The floor space occupied by the machine is 42½ in. by 73 in. and the weight is 5500 lb.

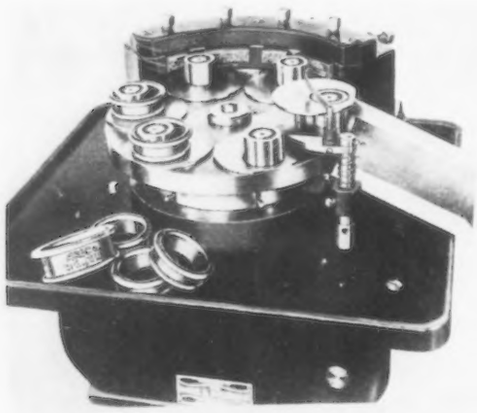
Valve for Reversing Furnaces

The Egler reversing valve for air or gas, manufactured by the Duff Patents Co., Inc., 321 Union Trust Building, Pittsburgh, is being offered as a solution of the valve troubles common to reversing furnaces. Simplicity of construction is said to make installation easy, and operation is made simple by a light cover. Moving parts are accessible, and through accurately controlled flow of gas or air, live and inert gases are not present in the valve at the same time. This insures against burning out of the interior of the valve. The valve is readily centered, leaving the flues well open. It can be operated by hand hydraulically or electrically.

Machine for Marking in Four Different Positions on the Same Piece

Marking in four different locations on the same ring is accomplished by a new machine which has been developed by the Noble & Westbrook Mfg. Co., East Hartford, Conn. The machine is equipped with a large die holder, which carries four marking dies, and the marks are spaced at approximately equal distances apart.

Parts to be marked are placed on the stations or



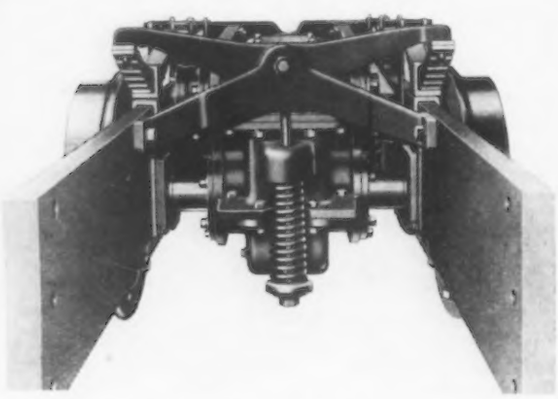
The Dial Revolves Continuously, Carrying the Pieces to the Marking Dies. Marked pieces are unloaded automatically

pins on the dial, which revolves continuously, carrying the pieces to the die where they are marked. Operation is automatic, the only duty of the operator being to place the parts on the stations as the dial revolves. The dial is driven by a worm and gear which operates in a bath of oil.

The machine, designated at the No. 24 Rapid Production marking machine, is designed for marking a variety of tubular parts of thin material, without distortion. Production up to 100 pieces per min., depending upon the size of the piece and the speed of the operator, is said to be obtainable. The machine is motor driven and is self-contained. It weighs approximately 425 lb.

Gasoline Locomotive with Spring-Suspended Power Plant

A gasoline locomotive said to be new in design and drive principle has been brought out by the H. K. Porter Co., Pittsburgh. The power plant, clutch and transmission are mounted on a steel sub-frame and form a straight-line drive to the reverse unit. This sub-frame acts as a torque arm pivoted on the rear axle and



Showing the Method of Spring Suspension of the Sub-Frame and Power Unit

spring-suspended at the front to the main frame. By an ingenious arrangement the weight of the rear end of the sub-frame is carried on the main frame by a coil spring.

As a result, all the vital parts of the locomotive—the engine, radiator, clutch transmission and reverse unit—are mounted on a sub-frame which is spring-suspended to a spring-suspended cross-equalized main frame. For the power plant and transmission, as mounted on the sub-frame, patent is pending.

Main frames and bumpers are made of rolled steel slabs, as used on Porter steel works locomotives. The running gear, including steel-tired driving wheels, side rods, driving boxes, shoes, wedges, springs, etc., is the same as on the Porter steam dinkey.

New Line of Portable Electric Drills

The Stanley Rule and Level Plant, New Britain, Conn., has placed on the market a line of portable electric drills, two models of which are illustrated herewith.

General features include strong and rigid construction and offset spindles to permit drilling in close corners. The handle is shaped to fit the hand, and the control switch, of standard quick make-and-break type, is placed so that it can be operated to start or stop the motor without releasing the firm grip of the fingers on the handle. Ample supply of air around the motor for cooling purposes is provided by means of a fan on the armature shaft. This fan draws air into the frame at the rear of the drill, cooling the brushes and the commutator and, by means of baffles, the air is passed between the armature and field and out through tangential holes in the housing. Universal motors with large reserve capacity are employed and are arranged so that they may be observed while running. Commutators and brushes may be cleaned conveniently. The brushes are

The Chuck Key Is Securely Fastened in a Recess on the Drill

Alloy Steel Gears and Ball Bearing Motor Shaft Are Features of Both Machines

of standard pig-tail type having 500 hours working life and may be readily replaced when necessary.

Gears are of alloy steel, heat-treated, and operate in grease in leak- and dust-proof housings. Ball bearings set in steel jackets molded into the aluminum castings are used on both ends of the armature shaft of all machines except the ¼-in. capacity standard-duty drill. The latter, which is designated as the type No. DG23, has a ball bearing at the outer end only. Radial ball thrust bearings are used on all chuck spindles in addition to long bronze sleeves to maintain alinement and obviate wear. Three-jaw chucks are fitted to the ground spindles and on all machines the chuck key is securely fastened in a recess on the drill. The key is arranged so that it may be released instantly for use.

Each machine is equipped with 12½ ft. of duplex rubber covered cable which is fastened to the drill by a clamp designed to take all strain from the wire connections. At the other end there is a heavy armored plug with a cable grip, which is also intended to relieve the strain on the wire connections.

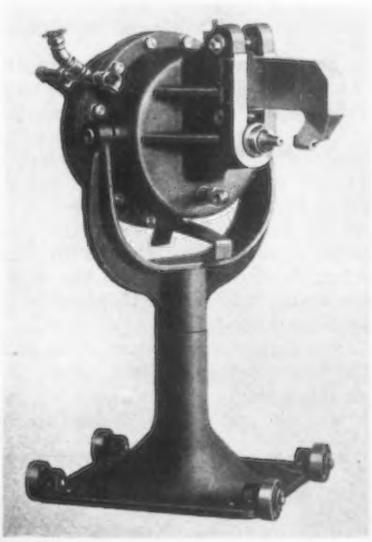
One of the machines illustrated is the type No. DB14 for heavy duty and with capacity for ¼ in. in

steel. It is designed for continuous production work. The chuck speed is 1300 r.p.m. at no load and 750 r.p.m. at full load. The length of the machine, overall, is 13 in. and the net weight is 8 lb. The ½-in, heavy-duty drill, designated as the type No. DJ6, is also illustrated. The chuck speed of this machine is 550 r.p.m. at no load and 350 r.p.m. at full load. The length, overall, is 17½ in. and the net weight is 17½ lb.

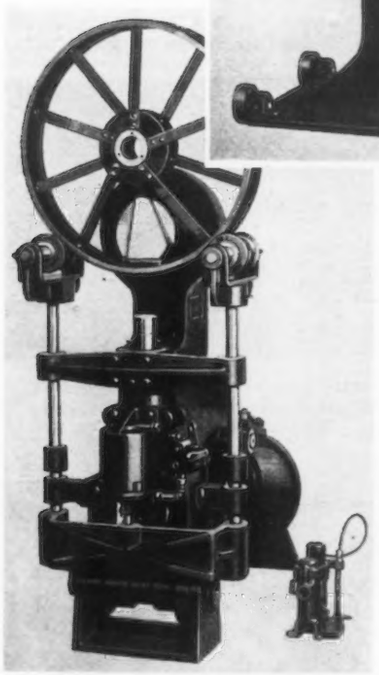
SPECIAL RIVETING MACHINES

Tractor Wheel Unit and Push-Type Chassis Frame Machine for Cold Riveting

TWO new pneumatic riveting machines, one a tractor wheel riveter and the other a push-type chassis frame riveting machine, have been brought out by the Hanna Engineering Works, 1765 Elston Avenue, Chicago.



The Tractor Wheel Riveter, Below, Cold Heads Two Rivets at One Stroke



The Chassis Frame Riveter, Above, Is Available in 15 and 20-Ton Capacities

The arrangement of the tractor wheel riveter may be noted from the accompanying illustration. The machine has a reach of 4 in., a gap of 10 in., and is designed to cold-head two ⅜-in. rivets, which secure the spoke to the rim, at each stroke. Rivets are inserted from above and headed from below, an air-actuated elevating device nesting the manufactured heads of the rivets in the upper die. The machine is adjustable for tractor wheels from 32 in. to 56 in. in diameter.

The riveting driving unit is the company's pneumatic toggle and lever mechanism. The toggles are designed to close the gap between the riveting dies with minimum of air consumption and the lever serves to exert uniform tonnage on the dies through a considerable portion of die stroke, regardless of variation in thickness of the work.

Wide acceptance of cold riveting by the automotive industry has resulted in the development of a number of single-purpose riveters. One such machine is the Hanna pneumatic "push-type" chassis frame riveter, shown in the second illustration, claims for which include accuracy of die alinement for cold riveting, and simplicity and ruggedness to assure continuous operation.

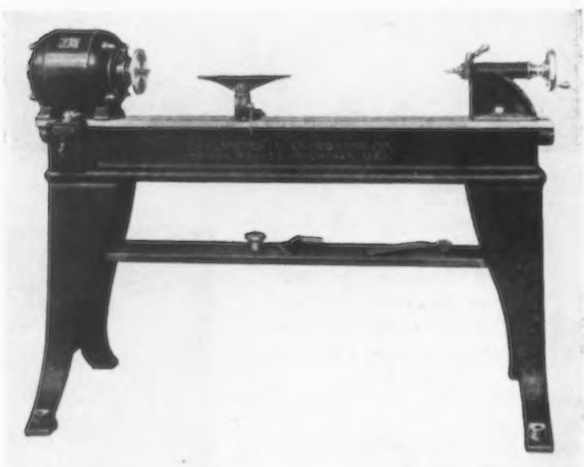
The riveter drives the horizontal rivets which secure the chassis frame cross members to the web of the side bar, as well as the rivets which secure step hanger brackets to chassis frame. The inner, or stationary, nose is "C" shaped to hook over the flange of the side bar, which operation is facilitated by the provision for tilting the rivet driving mechanism above the horizontal axis of the dies.

Arranged as shown, the rivet driving mechanism may also be rotated upon a vertical axis which, with the cross travel provided, permits riveting on both sides of the chassis frame as it passes through the riveting line. The riveter has 3-in. reach, 7-in. gap, 2½-in. die stroke. It is available in 15 and 20 tons capacity for driving 5/16-in. and ⅜-in. rivets cold.

Speed Lathe With Motor in the Head

The Gallmeyer & Livingston Co., Grand Rapids, Mich., is placing on the market a new "Union" motor-in-head speed lathe equipped with single-speed motor. The machine is available in three sizes, for work 24, 40 and 52 in. respectively, between centers. The beds are furnished in lengths of 4 ft. 2 in., 5 ft. 4 in., and 6 ft. 4 in.

The machine may be equipped with one, two or three-phase alternating current, or 115-volt or 230-volt direct current, ½-hp. ball-bearing motors, and may be furnished for spindle speeds of either 1725 r.p.m. or 3450 r.p.m. Where the machine is desired for both large and small work, and only one machine can be installed, two interchangeable motors, one high-speed and one low-speed, can be furnished for use on the one machine.



Low and High Motors Are Interchangeable to Give Suitable Spindle Speeds for Large and Small Work

Change from one motor to another may be made conveniently.

Work up to 12 in. in diameter may be handled over the bed and work up to 9½ in. over the tool rest. The distance from the floor to the top of the bed is 36 in. and from the bed to the centers, 6 in. The bed is cast in one piece, machined the entire length and supported by heavy cast legs. The lathes are equipped with a rigid and accurate tailstock which may be located in position or released from fixed position by a half turn of a special wrench. The tailstock spindle is 1 5/16 in. in diameter, bored for No. 2 Morse taper, and adjustments are made by means of a conveniently located handwheel. The spindle is clamped rigidly in place by means of a quarter turn of the lever provided for the purpose. The tool rest is adjustable vertically, to and from the work, and swings at any desired angle. The rest may be moved to any point on the bed and instantly located in the desired setting.

DIAL INDICATING GAGES

Devices for Shop and Inspection Use Show Variations Up to 0.00004 In. from Master

DIAL gages, designated as Mikrotasts, brought out by Friedrich Krupp, A.G., Essen, Germany, for measuring external and internal diameters and tapers, for thread gaging and as special instruments for a variety of applications, have been placed on the American market by the Coats Machine Tool Co., 110 West Fortieth Street, New York.

The gages are intended for shop, as well as for inspection department and laboratory, use. They measure up to one-thousandth part of a millimeter or one twenty-five-thousandth of an inch (0.00004 in.) and such readings can be seen with the naked eye. All gages are set to masters and deviations from a given master or sample are indicated in plain figures on the dial. It is claimed that one of the Mikrotast gages with a range of 1½ to 3 in., and having 16 measuring plates, will replace 48 snap gages with their respective master gages. This is attributed to the large range of the indicator needle of the Mikrotast, and to the large capacity of the various adapters.

Two types of the gage are made, the large type, the 60E, with 60 dial divisions, and a smaller model, the 12E, with 12 dial divisions. Dials may be graduated in millimeters or in inches. Red limit pointers are provided, these pointers being adjustable and locked in position by means of knurled screws at the back of the dial element. All measuring parts of the gage are of Krupp steel, surface hardened by a special nitrogenizing process. Wear on the measuring faces may be taken up by means of positive adjustment. All measuring parts are interchangeable.

Various adapters, with ball or needle points, are supplied for using the gage with special measuring appliances, such as height comparators, eccentricity testers, or for fine adjustments during accurate machine tool operations. By turning a thumb nut the contact point is raised or lowered during the gaging process.

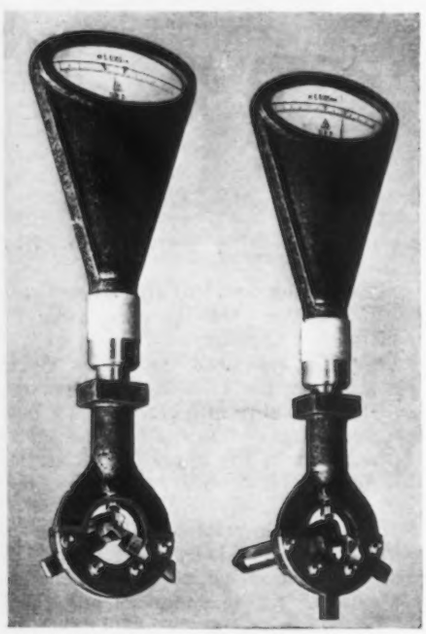
Saddle Gages for Checking Rolls

One form of Mikrotast gage available is the saddle type, for measuring external cylindrical diameters. This gage, illustrated herewith, consists of a Mikrotast mounted on a saddle with adjustable hardened and ground measuring flats of 39-deg. angle and a movable gaging point which acts on the Mikrotast through a lower and upper transmitting rod. The angle of 39 deg. on the saddle makes the path traveled by the gaging point equal to the change in diameter of the work. After having been set to the master and placed upon the work, the gage will register any variation in size or deviations from a true circle. The measuring flats on the saddle are relieved to assure positive seating on the work with immediate action of the indicator needle on the dial.

Saddle gages with 39-deg. angle are available in six

The Saddle Gage of 90-Deg. Angle for Checking Rolls During Grinding Is Shown Above. The same type of gage with adjustable flats of 39 deg., and movable gaging point, is shown below

Use of the Internal Gage for Checking a Ball Bearing Seat, a Blind Hole, During the Grinding Operation Is Pictured Above



Mikrotast Saddle Gage With 36-Deg. Angle for Checking Lands of a Spiral Reamer With Five Flutes Is Above, at Left

Pitch Diameters of Taps With Three or Four Flutes Are Measured by the Gages Shown Above, at Right. For root and outside diameters, interchangeable measuring pieces and movable contact points are available

sizes for diameters from ¼ to 8 in., and ranging in weight from 5¼ oz. to 4¼ lb.

The gages can be used on wet grinding operations, as the gaging point is above the work and thus is not exposed to the grinding coolant. The work remains in position on the machine during the gaging. The gages are also offered for use in connection with spherical, hollow, or cylindrical grinding operations, also for checking camber and wear on rolls, etc. For roll work, saddle gages with a measuring angle of 90 deg. are available. The ratio of expansion of the cast-iron body of these gages is practically the same as in the rolls. When using a saddle of 90-deg. angle, the travel of the gaging point is only equal to one-fifth of the difference in diameter on the work; with an angle of 39 deg. the travel would equal the difference in diameter. The Mikrotast used with the 90-deg. saddle is adjusted to compensate for this difference.

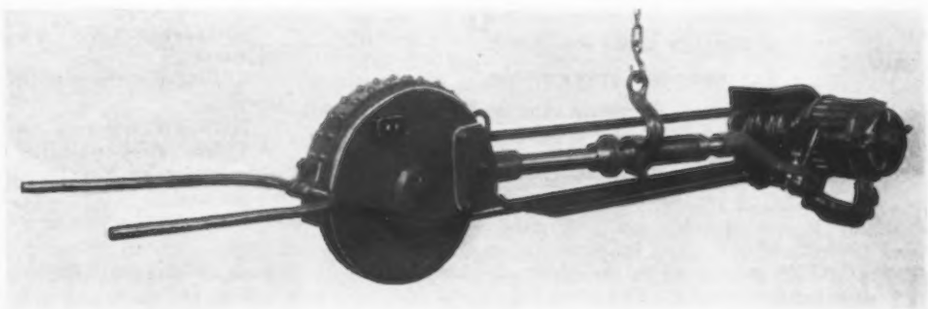
Use of these gages for checking the lands of a spiral reamer with five flutes is illustrated. In checking such reamers, with odd or even numbers of flutes, it is not necessary to remove the work from the machine. The angle of the measuring flats must conform to the work, a saddle with a 36-deg. angle being used for a five-fluted reamer.

Internal gages are manufactured in two types, fixed gages and self-accommodating gages. The range of the two types differ. On the fixed gages, one of which is

(*Concluded on page* 917)

Swing-Frame Grinder for High-Speed Snagging

The swing-frame grinding machine shown in the accompanying illustration was designed by the Norton Co., Worcester, Mass., to meet the requirements of the high-speed wheel service that has resulted from the development of the Bakelite-bonded grinding wheels,



Bakelite - Bonded Wheels, Which May Be Operated at 9000 Surface Ft. Per Min., Are Employed. Wheel changes may be made conveniently. A toggle arrangement on the motor serves to release the V-belt. A single bolt is removed and the wheel head drops to the floor

which, as described in THE IRON AGE of July 7, 1927, may be operated at a surface speed of 9000 ft. per min.

Although ruggedly built, the machine weighs only 850 lb. In addition to the light weight, the machine is balanced both laterally and rotatively to facilitate handling. A fabricated steel hood, which complies with the safety code requirements for wheels operated at the rated speed of the machine, provides protection for the operator. Grinding wheels 24-in. in diameter, 2-in. to 3-in. thick, with either 8-in. or 12-in. holes can be accommodated, and either the 20-in. or the 24-in. may be operated at 9000 surface ft. per min. Two speed changes are provided by means of a duplex sheave on the driving motor.

The grinding wheel is driven by two flexible V-belts, one on each side of the wheel. This drive arrangement permits making the wheel-flanges and sheaves integral, which results in narrow wheel-head assembly. The operator has a clear view of the work being ground from either side of the machine, there being no outboard bearings nor wide belts to intervene. This unobstructed view of the work is emphasized as making the machine particularly suited for the grinding of billets. In addition to providing positive drive, the V-belts shed grinding dust and other foreign material.

Suspension of the machine may be from the center only, where the headroom is limited or where for other reasons it may be preferred. The machine may also be fastened rigidly to the ceiling by means of a cable at the rear, and the wheel-head supported by a counterweighted rope running over pulleys.

Heavy-duty barrel-type ball bearings are employed, the complete bearing assembly, which is dust-proof, being within the hole of the wheel. Wheel changes may be made conveniently. A toggle arrangement on the motor serves to release the V belts; a single bolt is removed and the wheel-head drops to the floor. The old wheel is removed by taking off a combination sheave and flange. Completely inclosed 10-hp. ball-bearing motors, designed for grinding duty, are used for alternating current installations. Control is by push buttons on the wheel-guard within convenient reach of the operator. A sheet iron guard to protect the V-belts and motor sheaves from grinding chips is a part of the standard equipment.

Small Motors Designed to Start Across the Line

A line of squirrel cage motors from 1 to 30 hp. has been developed by the Triumph Electric Corporation, Cincinnati, for control by automatic push button system. These are designed to develop at least 150 per cent of the full load torque at starting, when connected directly across the line. There is no compensator or resistance type starter used, and the current taken is below the limits set by regulations.

These motors are fitted with Timken roller bearings, but can be supplied with either ball or sleeve bearings if desired. The price is less than for the squirrel cage motor and compensator.

Exports of Aircraft Growing Rapidly

Exports of aircraft, engines and parts from the United States in 1927 were valued at $1,903,460, a gain of 85 per cent over 1926 and 143 per cent over 1925, according to the transportation division, Department of Commerce, Washington. Purchases made from us by 47 countries during the three years amounted to $3,714,429. The leading amounts purchased were by Canada, Peru, Soviet Russia, United Kingdom, Chile, Argentina, Germany, Philippine Islands, Mexico, Colombia, Belgium, Brazil, Japan, Siam, China, Australia, Netherlands, Honduras and Nicaragua.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

GENERAL BUSINESS OUTLOOK

Favorable Factors

1. Building activity large and increasing; real estate markets show increased activity.

2. Automobile production expanding.

3. Unfilled orders continue to gain.

4. Retail trade recovered a little in February.

5. Foreign trade increased.

6. Commodity prices stable.

7. Money abundant and interest rates moderate.

8. Strong financial position of most leading companies.

Unfavorable Factors

1. The P-V line declines, indicating that the demand for commodities has not increased in proportion to the supply.

2. Farm prices and the purchasing power of the farm dollar decreased in February.

3. Bank credit over-extended for stock market purposes; brokers' loans excessive; speculative excesses in the stock market.

4. Gold exports rather heavy.

5. Average daily crude oil production increased.

6. Severe competition in the automobile business.

7. Profits small in many industries.

8. Disturbed political conditions; possible injury to Republican party from the oil scandal.

FACTORS mentioned in the above list are of very unequal importance. The most important ones indicate that business expansion will proceed during the spring. The failure of commodity prices to show strength, however, and the downturn of the P-V line indicate that the supply of commodities has gained on the demand, and this suggests that recovery in business will be halted by mid-year, if not sooner. The possibility of a crash in the stock market exists, and that would have unfavorable effects on business. Political uncertainties are obvious. But during the next two or three months a general upward trend in industrial activity is to be expected, though profits will probably not be in proportion to the volume of business.

In connection with the existing absence of buoyancy in commodity markets, it is to be remembered that industrial production did not fall much below normal requirements during the recession last year and that, consequently, no general shortages of commodities developed. Such evidence as we have indicates that stocks of manufactured commodities (other than foodstuffs) held by manufacturers are large and have decreased little. We need continually to remember that the capacity of our great basic industries is in excess of normal requirements. This fact is illustrated by the rapid stepping-up of production to above-normal levels in the course of a month or two.

The duration of the present rising trend will depend upon the moderation with which producers in various industries proceed, and upon the balance which is maintained among the different branches of industry and agriculture.

P-V Line Predicts Downturn in Fall

FROM the point of view of a business forecaster, perhaps the most interesting development to report this month is the fact that the P-V line has turned downward. This is the first decline in about a year. This general business barometer (a ratio of commodity prices to the physical volume of trade) has a remarkable record and its decline merits careful attention.

First, however, one should note that the P-V line gives its indications several months in advance. Thus its upturning last May was not reflected in general business conditions, sufficiently to cause a rise in steel production, until last December, or seven months later. At present the P-V line is well above normal and its period of rise from May, 1927, to January, 1928, is still to be reflected in the industrial situation. In short, it

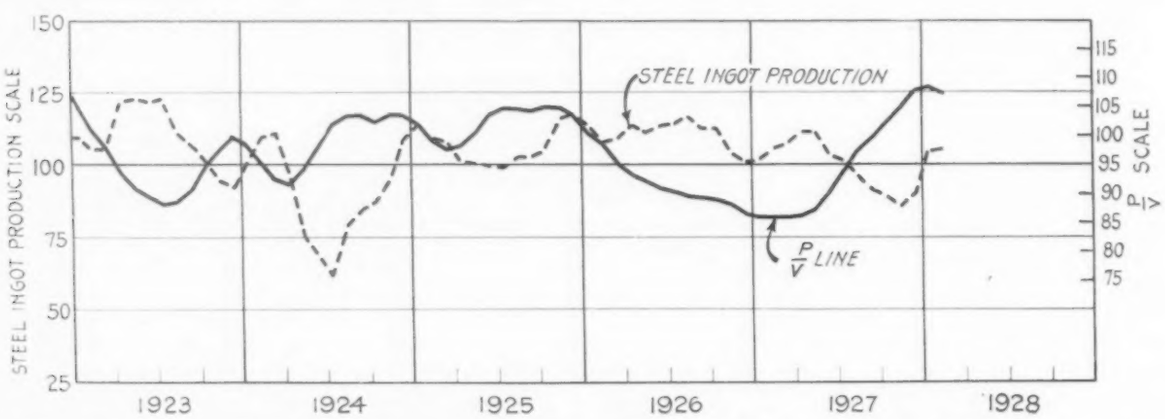


Fig. 1—Upward Movement of the P-V Line (Ratio of Commodity Prices to Physical Volume of Trade) Has Been Checked After Nine Months. Steel production advanced further in February and heavy tonnages may be expected for several months

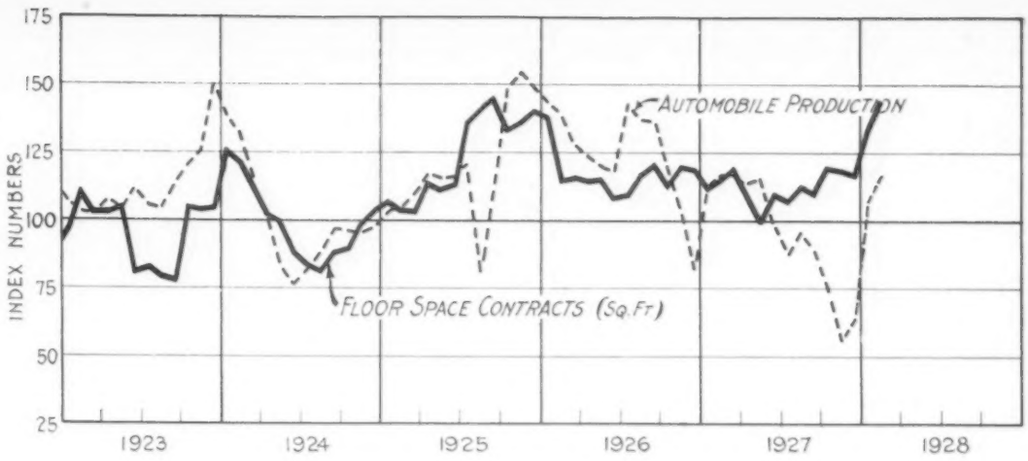


Fig. 2—Potential Demand for Steel from Construction Activity Continues Strong. Improvement in the automobile demand for steel should proceed through the spring

is not probable that we will have a general business setback or any considerable recession in steel production for several months.

Experience shows the following facts: The peak of the P-V line toward the end of 1922 was followed about seven months later by the peak of steel production. The lag in 1924 was about three months. The decline in the barometer line in December, 1925, was fully reflected in the steel situation only in September, 1926, a lag of nine months. Thus there is no uniformity. But, judging by the past, the peak of steel production this year is to be expected some time between April and August.

Production Large in Relation to Demand

Of course, we do not know what the P-V line will do during the next few months. It might continue sidewise, as it did in the latter parts of both 1924 and 1925, or it might decline, as it did following the peaks in 1922 and 1923. We can say this much: The present decline in the barometer line is chiefly due to the failure of commodity prices to rise while the physical volume of trade has turned upward. As there is every indication of a further expansion in the industrial output, while there is equally strong evidence that the commodity markets are showing no considerable upward trend, we may infer the probability that the P-V line will decline further. This would mean that production is too large to be supported by the markets at present price levels and that probably lower prices and profits will follow.

We will suspend judgment for another month or two, until the situation is registered more definitely in the course of the barometer. Meanwhile, industry in general and the steel industry in particular may be expected to show further gains. Even should this prove to be the beginning of a continued decline in the P-V line, steel production might not reach a peak before June.

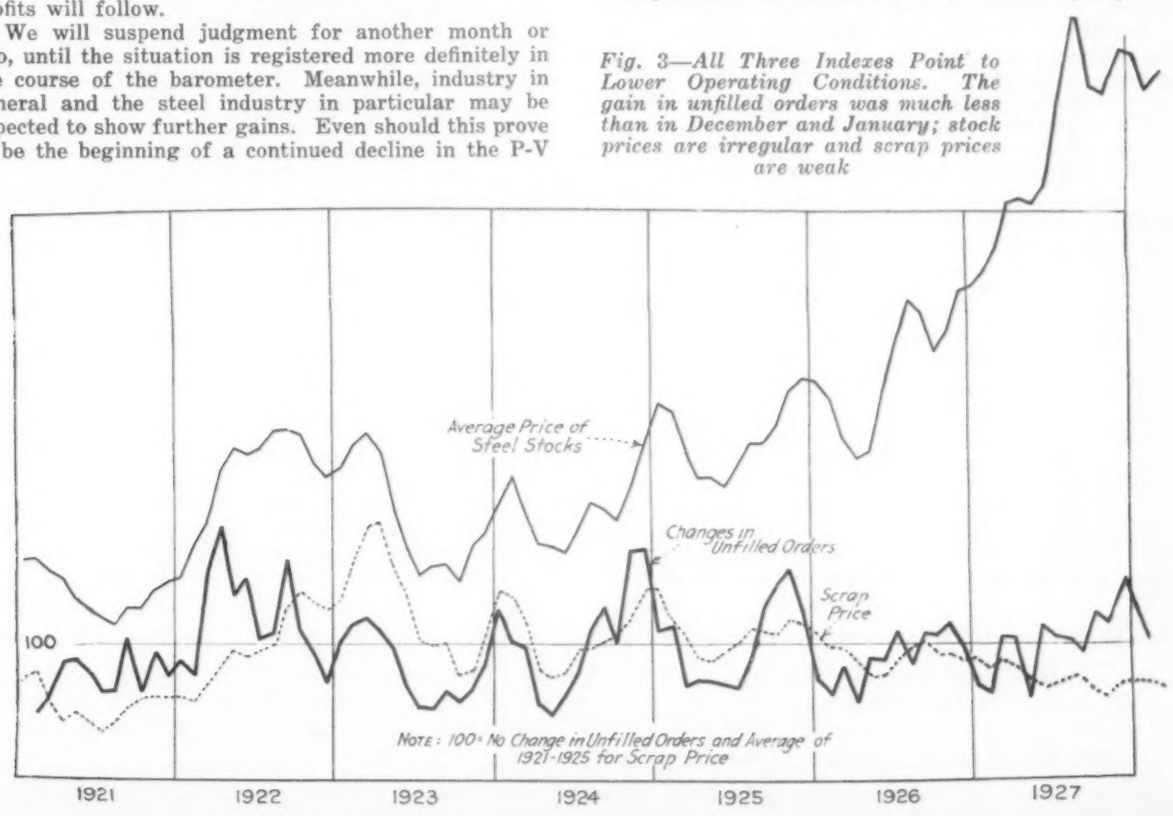
Increasing Building Operations and Car Output

SHARP gains in building activity and automobile production are for the near future the most favorable auguries. This is particularly true as to the outlook for the steel industry. It is almost inconceivable that the steel industry should not benefit by the trends shown in the second chart.

Building activity (measured by the floor space in contracts awarded) almost attained a new peak in February, having been exceeded only in September, 1925. Of course, this statement concerns figures which have been so adjusted as to exclude the merely seasonal changes from month to month. The February index shows building contracts to have been 144.1 per cent of the average for 1921-1927. This compares with 133.6 in January and 114.8 a year ago. The September, 1925, index was 145.1. The condition is practically certain to be reflected in large orders for structural steel and other building materials and should be sufficient to insure good business for producers of building material throughout the spring, even should some decline ensue.

Total production of motor cars and trucks in the United States and Canada amounted in February to about 335,900, which is the largest number produced in any month since last June. Our seasonally adjusted

Fig. 3—All Three Indexes Point to Lower Operating Conditions. The gain in unfilled orders was much less than in December and January; stock prices are irregular and scrap prices are weak



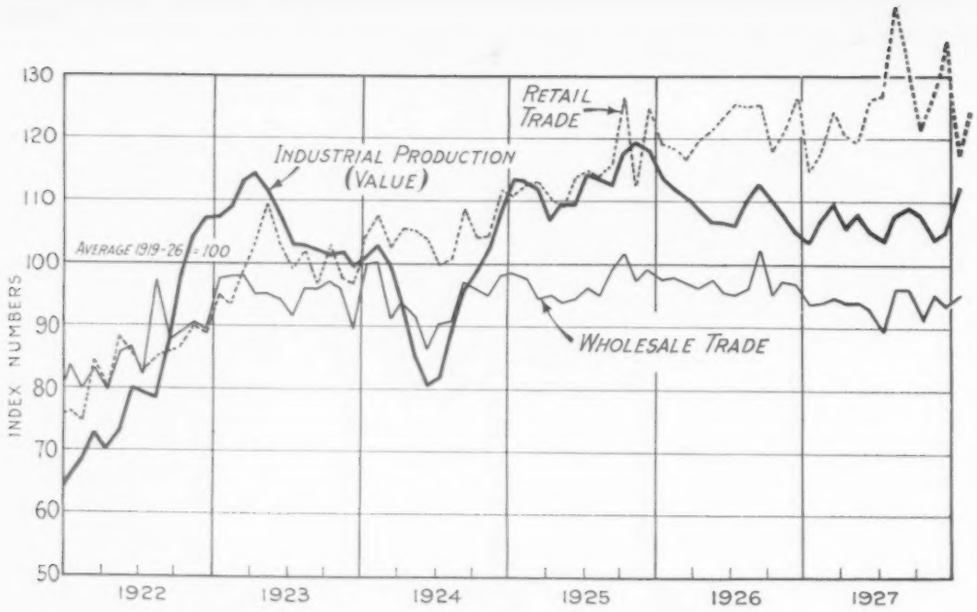


Fig. 4—Continued Favorable Indications Are Seen from the Relations of Retail Trade, Wholesale Trade and Industrial Output. Retail trade shows improved buying sentiment. Wholesale business continues slow, while industrial production is well above normal

index for the month was 116.8, against 106.1 in January and 117.3 a year ago (the average for 1921-1927 being 100). The similarity between the building curve and the automobile curve indicates that the same conditions that stimulate building activity affect the purchase of automobiles and trucks. Indeed, building activity is one of the chief factors in the demand for trucks. We may, therefore, expect a further rise in the automobile curve during the spring.

Unfilled Orders and Stock Prices Hesitant

WHEN we turn to the third chart, we find a somewhat different situation, since all the curves here point downward, and these suggest a not distant termination of the expansion in steel. It should be noted, however, that the immediate condition of the barometers shown in the chart is one of stability or very slight decline, rather than of any severe reaction.

The unfilled steel orders barometer, for example, shows that in the case of the United States Steel Corporation these orders are still gaining, but at a less rapid rate. The February increase was only 122,000 tons, against an increase of over 500,000 tons in December. The declining rate of increase in the unfilled orders usually indicates that shipments are gaining on the volume of new business, a condition which usually precedes a setback. The real trouble, however, is not likely to appear until an actual decline in the unfilled orders occurs, and it remains to be seen what the March results will be.

The scrap market of late may have temporarily lost some of its significance as an industrial barometer. Certainly the trend of scrap prices did not reflect the improvement in the steel industry that developed toward the end of 1927, or at least did so but slightly. The average price of heavy melting steel scrap at Pittsburgh was slightly lower in February than in January, and at the present writing it is only $14.75, which is lower than the February average.

The average price of a representative group of steel stocks is considerably below the peak reached last September, and the general impression one gets is that these stocks have been very irregular, though maintained at a high level. The reaction since last December is in conformity with the indications given by the unfilled orders barometer. On the whole, it seems worth noting that the decline in this barometer, together with the rather weak tone in the scrap market, gives ground for doubts concerning any large expansion in the steel industry or the possibility of a further sustained advance in the price of steel stocks.

Trade Indexes Point Strongly Upward

TURNING to more general indications of the state of industry and trade, the fourth chart shows that retail trade, wholesale trade, and the total value of industrial production all point upward, as of the latest available dates. Moreover, retail sales are well up to the average of the last two years, which may fairly be called a high level, and are well above the estimated value of the total industrial output.

Our adjusted index of retail trade, based on the average for the years 1919-1926 as 100, stood at 124.3 in February and compares with 117 in January and 117.9 a year ago. Some allowance is to be made for the extra day in February this year; but, even so, there was a net gain over the preceding month and a year ago. As the usual seasonal variation from month to month is eliminated, the February recovery may be taken to indicate improved buying on the part of the great mass of the people.

Changes in Wholesale Situation

Wholesale trade levels continue well below the average for 1919-1926, but this is chiefly due to changes in methods of distribution. Probably wholesale trade has settled by this time to something like its new normal level, however, and the current trend from month to month has some significance. The low point was reached last October, when the adjusted index was 91. In January it had risen to 95. This may well have reflected a month in advance the February recovery in retail sales.

The estimated *value* of the total industrial production gained sharply in January, reaching the highest point since September, 1926. The January index was 112 per cent of the average for 1919-1926. This is a decidedly favorable indication. It shows that, in spite of the sharp increase in the output of mines and factories, the general level of commodity prices has been sufficiently well maintained to make the product—production × price—rise. This is a clearer demonstration of real business expansion than can be made on the basis of physical volume alone. No business recession is near, while the total *value* of industrial production is gaining and is below the level of retail sales.

Schedule of the next instalments of the ***Business Analysis and Forecast,*** *by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***April 12****—Activity in Steel Consuming Industries;* ***April 19****—Position of Iron and Steel Producers;* ***April 26****—General Business Outlook.*

Exports and Imports Decline

Drop in Short Month Was 9⅔ Per Cent in Exports and 19 Per Cent in Imports—Fewer Rails Sent Abroad

WASHINGTON, March 26.—Making a decline of 19,851 gross tons, exports of iron and steel products from the United States in February totaled 185,915 tons, against 205,766 tons in January. Imports dropped to 47,628 tons, as compared with 58,635 tons. For the eight months ended with February, exports aggregated 1,441,049 tons, against 1,527,656 tons for the corresponding period of last year. Imports totaled 472,798 tons for the eight months ended with February, 1928, against 606,945 tons for the eight months ended with February, 1927.

On a daily basis exports in February were 6411 tons against 6638 tons in January. February shipments, however, showed a fair increase over those for the same month of last year, when the total was 166,129 tons. The January shipments were the largest for any month since January, 1927, and it is believed they, like February shipments, were stimulated by the lower export rates which went into effect on Jan. 1, 1928.

The heaviest decline in exports in February of the present year was in rails, 15,846 tons having been exported against 23,174 tons in January, a loss of 7743 tons. This item has been showing gradual decreases in exports, apparently because of the fact that some countries which formerly drew substantial tonnages from the United States have now become self-contained or nearly so. Other decreases in exports in February when compared with January were in boiler tubes and welded pipe, black steel sheets and wire rods. Gains were made in 16 classes, including plain structural shapes, steel bars, raw and semi-finished material and ferrogmanganese. Notable losses made in the eight months ended with February were in steel bars, black and galvanized sheets, tin plate, steel rails, and boiler tubes and welded pipe. The more important gains were made in scrap, structural shapes and barbed wire and woven wire fencing.

Of the 6214 tons of black welded pipe exported in February, 1605 tons went to Japan, 769 tons to the United Kingdom, 544 tons to Mexico, 410 tons to Peru, 399 tons to Argentina, and 389 tons to Canada. Of the 2400 tons of galvanized welded pipe exported during the month, 393 tons went to Cuba, 344 tons to Argentina, 247 tons to the Philippine Islands and 142 tons to Costa Rica. Chile was the largest buyer in February of American rails, taking 3627 tons; the Philippine Islands came second with 2247 tons and Colombia third with 1308 tons. Canada's purchases,

Exports of Iron and Steel from the United States

(In Gross Tons)

	February		Eight Months Ended February	
	1928	1927	1928	1927
Pig iron	3,494	2,427	36,350	22,253
Ferromanganese	2,069	39	3,418	507
Scrap	29,618	7,693	193,244	53,860
Pig iron, ferroalloys and scrap	*35,181*	*10,159*	*233,012*	*76,620*
Ingots, blooms, billets, sheet bar, skelp	7,868	2,552	72,820	77,545
Wire rods	1,345	1,383	12,831	13,606
Semi-finished steel	*9,213*	*3,935*	*85,651*	*91,151*
Steel bars	10,468	10,052	73,106	92,093
Alloy steel bars	1,017	372	4,658	3,233
Iron bars	175	354	1,918	3,809
Plates, iron and steel	11,195	8,850	90,484	89,326
Sheets, galvanized	11,319	11,457	88,823	121,224
Sheets, black steel	13,291	17,708	93,139	122,138
Sheets, black iron	1,069	2,450	10,375	12,385
Hoops, bands, strip steel	3,786	4,113	24,896	29,263
Tin plate; terne plate	18,129	28,776	139,162	223,086
Structural shapes, plain material	13,406	7,122	105,172	97,372
Structural material, fabricated	4,254	4,739	47,032	43,931
Steel rails	15,431	19,123	116,140	159,079
Rail fastenings, switches, frogs, etc.	3,512	2,115	30,624	26,877
Boiler tubes, welded pipe and fittings	15,846	21,495	148,260	221,268
Plain wire	3,212	2,239	26,574	16,379
Barbed wire and woven wire fencing	4,641	2,186	39,099	24,308
Wire cloth and screening	114	143	1,434	1,358
Wire rope	552	339	3,175	2,972
Wire nails	1,035	404	8,933	6,729
Other nails and tacks	692	557	5,882	4,329
Horseshoes	19	15	390	385
Bolts, nuts, rivets and washers, except track	944	846	8,276	7,997
Rolled and finished steel	*134,107*	*145,455*	*1,067,552*	*1,309,541*
Cast iron pipe and fittings	2,404	3,312	20,111	20,197
Car wheels and axles	1,416	681	9,404	9,908
Iron castings	1,206	1,013	8,199	6,143
Steel castings	896	261	4,419	3,588
Forgings	473	468	3,006	1,814
Castings and forgings	*6,395*	*5,735*	*45,139*	*41,650*
All other	1,019	845	9,695	8,694
Total	185,915	166,129	1,441,049	1,527,656

Imports of Iron and Steel into the United States

(In Gross Tons)

	February		Eight Months Ended February	
	1928	1927	1928	1927
Pig iron	6,387	4,417	89,763	141,185
Ferromanganese*	1,025	2,056	27,804	23,950
Ferrosilicon†	293	912	2,788	9,702
Ferrochrome‡	107	.....	191	359
Scrap	2,019	4,686	32,974	65,405
Pig iron, ferroalloys, and scrap	*9,831*	*12,071*	*153,520*	*240,601*
Steel ingots, blooms, billets and slabs	1,034	1,540	9,509	14,261
Iron blooms, slabs, etc.	1	.....	92	306
Wire rods	2,185	929	14,655	7,626
Semi-finished steel	*3,220*	*2,469*	*24,256*	*22,193*
Rails and splice bars	181	1,110	9,362	30,137
Structural shapes	13,450	10,294	111,042	94,935
Boiler and other plates	14	222	1,567	2,543
Sheets and saw plates	1,490	1,100	14,067	10,104
Steel bars	8,810	5,428	57,359	61,029
Bar iron	284	233	2,271	3,347
Hoops, bands and cotton ties	1,720	2,784	22,484	23,253
Tubular products (wrought)	2,396	3,061	22,086	27,755
Nails, tacks, staples	756	521	3,428	4,485
Tin plate	6	19	217	260
Bolts, nuts, rivets and washers	31	38	275	180
Round iron and steel wire	281	405	2,186	2,941
Barbed wire	236	839	1,767	2,206
Flat wire; strip steel	213	65	1,470	2,342
Steel telegraph and telephone wire	.....	1	51	1,070
Wire rope and strand	174	202	1,083	1,625
Other wire	53	18	984	476
Wire cloth and screening	.....	9	.....	281
Rolled and finished steel	*30,095*	*26,349*	*251,699*	*268,969*
Cast iron pipe	4,218	8,376	41,215	72,982
Castings and forgings	264	195	2,108	2,007
Total	47,628	49,460	472,798	606,752
Manganese ore*	18,215	21,585	188,230	225,908
Iron ore	229,578	192,904	1,820,717	1,793,841
Magnesite (dead burned)	.....	6,916	29,235	27,375

*Manganese content only.
†Silicon content only.
‡Chromium content only.

United States Imports of Iron and Steel Products in February

(In Gross Tons)

Austria	64	Sweden	1,897
Belgium	17,056	Switzerland	1
Bulgaria	2	United Kingdom	1,536
Czechoslovakia	30	*Total Europe*	*40,555*
Denmark	134		
France	9,816	Canada	3,217
Germany	6,776	Mexico	61
Italy	10	British India	3,794
Netherlands	2,999	Japan	1
Norway	21		
Poland and Danzig	213	Total	47,628

which have been declining, dropped to only 444 tons, while Japan, which also has been taking smaller rail tonnages from abroad, took none.

Canada was the heaviest buyer during the month of tin plate, taking 3139 tons of the total of 18,129 tons. Japan came next with 2761 tons, while Mexico was third with 1141 tons. Of the 13,408 tons of plain structural shapes exported in February, Canada took 11,299 tons; Cuba, 660 tons, and Japan, 441 tons. Canada took 10,242 tons of the 11,195 tons of plates exported during the month, and 2789 tons of the 11,319 tons of galvanized sheets exported. The Philippine Islands took 2670 tons of the latter. Of the 13,291 tons of black sheets exported, Japan took 6268 tons and Canada, 5518 tons. Canada purchased a total of 76,016 tons of the February exports; Japan came next with 25,220 tons.

The greatest declines in imports in February when compared with January were in pig iron, ferromanganese and scrap, while the most notable gains were made in structural shapes and steel bars. For the eight months ended with February the heaviest declines in imports, when compared with the corresponding period of last year, were made in pig iron, cast iron pipe, scrap, rails and steel bars. Gains were made in ferromanganese, wire rods and structural shapes.

Of the 1025 tons of ferromanganese imported in February, 594 tons came from the United Kingdom and 411 tons from Canada. Belgium provided 6032 tons of the 8810 tons of steel bars imported, while 1025 tons came from France and 945 tons from Germany. Belgium was the source of 6608 tons of the 13,450 tons of structural shapes imported; France, 4747 tons; Germany, 1137 tons, and the Netherlands, 742 tons. Of the 4218 tons of cast iron pipe imported, 3278 tons came from France and 928 tons from Belgium. British India provided 3794 tons of the 6387 tons of pig iron imported, and 2154 tons came from the Netherlands. Of the 18,215 tons of manganese ore imported during the month, 7169 tons came from Soviet Russia, 6643 tons from Brazil and 440 tons from British India.

Belgium was the principal source of the total imports, providing 17,056 tons. France ranked second with 9816 tons; Germany, third, 6776 tons, and the Netherlands, fourth, 2999 tons.

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	February, 1928	January and February 1928	January and February 1927
North and Central America and West Indies	*93,330*	*171,808*	*150,609*
Canada and Newfoundland	76,160	137,807	108,019
Cuba	6,544	10,436	16,721
Mexico	5,714	10,588	13,359
Guatemala	633	3,917	1,945
Panama	1,581	2,029	2,326
Salvador	295	512	639
British West Indies	478	1,019	1,957
Other West Indies	838	3,457	3,074
Other Central America	1,087	2,043	2,569
South America	*25,401*	*64,436*	*83,647*
Argentina	5,392	15,455	17,231
Brazil	1,772	10,790	17,321
Chile	6,450	12,260	4,687
Colombia	6,086	10,742	18,684
Peru	2,913	4,174	2,773
Uruguay	299	958	3,467
Venezuela	1,931	9,276	19,178
Other South America	558	781	306
Europe	*15,970*	*25,317*	*26,566*
Belgium	2,564	3,083	652
France	252	489	593
Greece	34	72	671
Italy	835	1,683	2,588
Netherlands	320	632	989
Russia	90	1,193	613
United Kingdom	4,521	9,226	15,543
Other Europe	7,354	8,939	4,917
Far East	*49,643*	*127,504*	*117,457*
British Malaya	566	1,070	3,439
China	8,649	23,506	18,052
Dutch East Indies	1,873	4,063	9,509
India and Ceylon	4,935	6,128	8,445
Japan and Chosen	25,220	72,540	58,807
Kwangtung	91	1,526	677
Philippine Islands	7,226	14,616	7,630
Australia	623	3,182	6,873
New Zealand	262	442	286
Other Asia and Far East	198	431	3,739
Africa	*1,571*	*2,616*	*3,804*
British South Africa	594	1,346	1,372
Egypt	668	734	476
Mozambique	124	170	1,147
Other Africa	185	366	309
Total	185,915	391,681	381,583

Much Lower Pig Iron Imports

Reduction of 41 per cent in imports of pig iron is shown by the February total of 6387 gross tons, compared with 11,090 tons in January. This follows a 22 per cent reduction in January from the 14,299 tons of December. A heavy decline is shown also in imports for the eight months ended Feb. 29, compared with the corresponding period of last year. There were 89,763 tons this year, against 141,185 tons a year ago. The drop was approximately 37 per cent.

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	February		Eight Months Ended February	
	1928	1927	1928	1927
United Kingdom	50	....	13,036	12,012
British India	3,794	1,565	53,263	17,041
Germany	....	634	1,440	73,653
Netherlands	2,154	....	16,959	28,020
Canada	93	248	301	1,997
France	....	....	3,000	3,416
Belgium	197	....	596	1,840
All others	99	1,970	1,168	3,206
Total	6,387	4,417	89,763	141,185

British India supplied more than half of the February imports and much more than half the total for the eight months. This is in contrast with a year ago, when Germany in eight months supplied more than half the total, with British India in third place, following the Netherlands. The table gives details.

High Tonnage of Iron Ore Imports Continues in February

Imports of iron ore in February are reported by the Department of Commerce at 229,578 gross tons. While this is a drop of 9 per cent from the January total of 251,178 tons, it is far ahead of the December figure and represents a gain of 19 per cent over February, 1927. For the eight months of the fiscal year the total has been 1,820,717 tons, a gain of about 1½ per cent over the corresponding period of the preceding year.

Chile has maintained a substantial lead over all other countries, having supplied more than half the February total and more than half the eight-month total. Details are shown in the table.

Sources of American Imports of Iron Ore

(In Gross Tons)

	February		Eight Months Ended February	
	1928	1927	1928	1927
Canada	36,270	488	59,528	12,963
Cuba	33,500	54,000	196,613	376,500
Chile	121,300	101,900	953,400	889,600
Spain	5,000	....	28,246	13,393
Sweden	....	7,008	148,330	68,665
French Africa	28,656	26,850	318,370	209,289
Other countries	4,852	2,658	116,230	223,431
Total	229,578	192,904	1,820,717	1,793,841

European Mill Prices Continue Firm

French Home Market Active—Germany Seeking More Exports —British Build Plant for Direct Steel Process

(*By Cable*)

LONDON, ENGLAND, March 26.

CLEVELAND pig iron has been quiet since the recent rise, but makers are well sold and stocks depleted. Some furnaces are in arrears with deliveries. Hematite is dull, but output is now about equal to demand so that makers are able to maintain prices.

Foreign ore is quiet, but consumers are pressing for deliveries on tonnage already purchased and, with congestion at loading ports increasing, there is some talk of price advances.

Finished steel is quiet, especially for export. Some works are busy on domestic orders, but others are reaching the end of their order books. The Barrow rail mills are closing at Easter for lack of business. Government supporters are endeavoring to secure protection for the iron and steel industry, but Parliament is not likely to take further steps.

The first plant operating under the Duffield process for making steel direct from ore is now in course of construction at Manchester and is expected to be completed in six months.

Tin plate is active and makers, being well situated, are not accepting less than 18s. ($4.39) per base box, f.o.b. works port. Export and domestic demand is broadening. Galvanized sheets continue quiet. Japan has purchased some fair quantities of light-gage black sheet specifications.

Continental iron and steel markets are quiet and prices of semi-finished material are declining, with German producers keen sellers for export. British users, however, are buying only sparingly.

Belgian production in February was 302,000 metric tons of pig iron and 301,000 tons of raw steel. At the end of February there were 55 furnaces in blast. The German steel mill association is maintaining domestic prices of semi-finished material and beams unchanged for April. The Luxemburg output in February was 220,000 metric tons of pig iron and 205,000 tons of raw steel. There were 38 furnaces in blast on March 1.

FRENCH HOME ORDERS LARGE

Mills Show Less Interest in Export Orders —Turkish Rail Contract Booked

PARIS, FRANCE, March 9.—Domestic business is still improving, but there is less activity in the export market. French producers are in a situation comparable with the German position last year. Demand in the home market is so great that mills are not seeking export orders and are quoting deliveries of from three to five months on most steel products. Iron and steel output is steadily increasing. Production of pig iron in January was 809,000 metric tons, compared with 796,000 tons in December and 762,000 tons in November. Steel output was 750,000 tons in January, comparing with 735,000 tons in December and 682,000 tons in November.

At the meeting of the International Steel Cartel in Paris, March 5, it was agreed that production quotas should be maintained without change. It was also agreed that part of the fines paid by Czechoslovakia for overproduction should be returned, the precedent being similar action taken last year in the case of Germany. The application of Poland for membership in the cartel was given further consideration, but no agreement could be reached, as Poland demands an export quota of 350,000 tons and exclusive rights to the Polish domestic market. The cartel has offered a quota of 300,000 tons, subject to reduction should the Polish domestic demand increase.

Following the sudden death of M. Mayrisch, president of the International Steel Cartel, it was reported that Fritz Thyssen might be the new president. He is temporarily occupying that position. It is understood, however, that the next president of the cartel will be selected from the Luxemburg membership.

Pig Iron.—In an effort to meet the competition of foreign pig iron, the entente, at a recent meeting, made price reduction of 15 to 30 fr. (59c. to $1.18) per metric

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	18s.				$4.39		
Bilbao Rubio ore*..	1	1¾	to £1	2s.		5.30	to	$5.36
Cleveland No. 1 fdy.	3	8½				16.56		
Cleveland No. 3 fdy.	3	6				16.07		
Cleveland No. 4 fdy.	3	5				15.83		
Cleveland No. 4 forge	3	4½				15.71		
Cleveland basic (nom.)	3	15	to	3	15½	18.27	to	18.39
East Coast mixed...	3	10				17.05		
East Coast hematite	3	10½				17.17		
Rails, 60 lb. and up.	7	15	to	8	0	37.75	to	38.96
Billets	6	0	to	6	10	29.22	to	31.66
Ferromanganese ...	13	10				65.75		
Ferromanganese (export)	13	0	to	13	5	63.31	to	64.53
Sheet and tin plate bars, Welsh	5	7½	to	5	15	26.18	to	28.01
Tin plate, base box.	0	18	to	0	18¼	4.39	to	4.45
Black sheets, Japanese specifications.	13	5	to	13	10	64.53	to	65.75
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.66	to	1.77
Boiler plates	9	2½	to	9	12½	1.98	to	2.09
Tees	8	2½	to	8	12½	1.77	to	1.99
Channels	7	7½	to	7	17½	1.60	to	1.71
Beams	7	2½	to	7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to	1.69
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	0	to	10	5	2.17	to	2.23
Galv. sheets, 24 gage	13	2½				2.85		
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to	3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	4s.	to	£3	5s.	$15.58	to	$15.83
France	3	4	to	3	5	15.58	to	15.83
Luxemburg	3	4	to	3	5	15.58	to	15.83
Basic pig iron (nom.):								
Belgium	3	0	to	3	1	14.61	to	14.85
France	3	0	to	3	1	14.61	to	14.85
Luxemburg	3	0	to	3	1	14.61	to	14.85
Coke	0	18				4.39		
Billets:								
Belgium	4	13				22.65		
France	4	13				22.65		
						C. per Lb.		
Merchant bars:								
Belgium	5	5				1.16		
France	5	5				1.16		
Luxemburg	5	5				1.16		
Joists (beams):								
Belgium	4	16				1.06		
France	4	16				1.06		
Luxemburg	4	16				1.06		
Angles:								
Belgium	5	5				1.16		
¼-in. plate:								
Belgium (a)	6	10				1.44		
Germany (a)	6	10				1.44		
⅜-in. ship plates:								
Belgium	6	6				1.39		
Luxemburg	6	6				1.39		
Sheets, heavy:								
Belgium	6	1				1.34		
Germany	6	1				1.34		

(a) Nominal.

ton in certain market centers where this competition is particularly keen, such as Lille, Roubaix, Valenciennes, Maubeuge, Dunkirk. Hematite iron prices were advanced 5 fr. (20c.) per metric ton, effective since March 1. For export, Continental pig iron producers are quoting phosphoric foundry iron at £3 3s. ($15.34) per ton, f.o.b. Antwerp, on orders for 1000 tons or more, an advance of about 1s. (24c.) per ton.

Semi-Finished Material.—Export offers of billets and blooms are scarce, and the tendency of prices is upward. Blooms are quoted at £4 4s. to £4 10s. ($20.46 to $21.92) and billets at £4 12s. to £4 15s. ($22.41 to $23.14) per ton.

Finished Material.—There is still considerable domestic business, but prices have ceased to advance. The recent rise in quotations ranged from 10 to 15 per cent. Most rolling mills are out of the market for the present or are quoting extended deliveries. For export, beams are held at £4 15s. to £4 17s. 6d. per ton (1.05c. to 1.07c. per lb.), and steel bars, at £5 7s. to £5 7s. 6d. per ton (1.18c. to 1.19c. per lb.). The new sales syndicate for beams is trying to reduce the wide margin that exists between beam and merchant steel prices. This evidently entails further increases in beam quotations.

Rails.—The Comptoir Siderurgique de France has received a contract from the Turkish Government for about 40,000 tons of rails, cross bars, bolts, fish plates and other railroad permanent-way material. Construction of the railroad in Anatolia is in the hands of a Swedish company. It is reported that a suggestion has been submitted to the European Rail Makers' Association that rail prices be advanced.

Bolt Maker Compares German and American Methods

HAMBURG, GERMANY, March 10.—In a paper read at a recent meeting of the Federation of German Hardware Manufacturers, Herr Schauerte, president of Bauer & Schauerte, Neuss, one of the largest German manufacturers of bolts and nuts, said that although American and European tools are the same, there are 20 to 30 times more tools wasted in bolt and nut production in Germany than in the United States.

Since 1920, Herr Schauerte has been to the United States five times and recently returned from an extensive investigation of the American bolt and nut industry and its methods. He recommended the introduction of American methods of manufacture, particularly as far as the heads of bolts are concerned. Raw material used in the United States, he said, was evidently much superior to the European. This, he said, was due principally to the fact that American bolt makers can obtain the exact analysis of steel they require and not, as in Germany, the grade of steel that the producer wishes to ship. He pointed out also that in the United States few of the large companies using bolts and nuts, such as motor car manufacturers, machinery builders and shipyards, make bolts for themselves as is the case among German users. The situation in Germany results in a larger number of small orders and higher costs, compared with fewer and larger orders in the United States and proportionately lower costs.

It was decided at the meeting to issue a list of specifications covering the quality of steel required for bolt and nut production.

Decline in German Aluminum Exports

WASHINGTON, March 27.—German exports of bar aluminum, plates and scrap declined to 5070 metric tons in 1927 from 13,896 tons in 1926, according to a report from the United States consul at Frankfort-on-Main, Germany. Exports to the United States dropped to 2073 tons in 1927.

The Société Lorraine des Aciéries de Rombas is proceeding with the construction of No. 3 blast furnace at Rombas, Moselle, France, under the direction of Emile Hemmer, director of mines and works. The Freyn Engineering Co., Chicago, has been retained in a consulting capacity for the work, particularly to determine the size and type of furnace best suited.

BELGIAN PRICES FIRM

Mills Seek Additional Business but Refuse to Make Concessions—Pig Iron Strong

ANTWERP, BELGIUM, March 9.—Prices on certain iron and steel products have receded slightly from the high levels reached a fortnight ago, but still reflect the independent attitude of producers. Mills rolling semi-finished material are granting no concessions, but are showing more interest in new business. Purchasing is confined to small lots, buyers preferring to wait as long as possible for further developments in the price situation. Mills, however, are well booked with tonnage and in a position to wait.

Pig Iron.—Demand is improving, and stocks at the furnaces and in consumers' yards are small. The export quotation on No. 3 phosphoric foundry iron is £3 3s. ($15.34) per metric ton, f.o.b. Antwerp. Bessemer hematite is quoted at 670 to 680 fr. ($26.33 to $26.72) per metric ton, f.o.b. furnace, but little business is being done, as German offers for this grade are much lower.

Semi-Finished Material.—Makers are well booked and are able to maintain prices, despite the recent decline in demand following advances in quotations. Billets are quiet, with prices firm at £4 13s. to £4 15s. ($22.65 to $23.14) per metric ton, f.o.b. Antwerp. Mills show little interest in booking further orders for blooms, which are quoted at £4 5s. to £4 10s. ($20.70 to $21.92) per metric ton, depending upon the sizes specified. Sheet bars are quoted at about £4 17s. 6d. ($23.75) per ton, f.o.b. Antwerp.

Finished Material.—Although mills are evidently seeking more tonnage, there is no disposition to make concessions. There is a steady flow of small-tonnage business. Steel bars are quoted at about £5 7s. 6d. per ton (1.19c. per lb.) and beams at £4 17s. 6d. per ton (1.08c. per lb.) f.o.b. Antwerp. Corrugated reinforcing bars are offered at about £5 17s. 6d. per ton (1.29c. per lb.). Hoops are quoted at £6 5s. per ton (1.38c. per lb.), f.o.b. Antwerp.

Russian Ore Trust Officials on Visit of Inspection Here

Chief Engineer A. N. Bakhtiarov of the Yurt, the Soviet Southern Ore Trust, has arrived in this country accompanied by three other officials of the trust, it was announced by the Amtorg Trading Corporation, 165 Broadway, New York. Representatives of the Yurt expect to make a three months' study of American production methods and of the mining equipment market.

"While we have not as yet reached the pre-war iron ore output," said Mr. Bakhtiarov, "the progress made during the past few years has been encouraging. Four years ago the Yurt produced less than half a million tons of ore. During each of the next two years we succeeded in doubling production, and increased the output by 47 per cent last year, with the result that in 1927 we produced three and one-half million tons of iron ore. Production of manganese ore reached 450,000 tons last year. This production, however, does not fully satisfy the needs of the expanding Soviet iron and steel industry. We intend to study American production methods and equipment with a view of increasing production in the Yurt mines. The allotment for capital construction by the trust for this year is $9,000,000."

New Aluminum Alloy in Germany

HAMBURG, GERMANY, March 10.—A new aluminum alloy with the trade name "Ultralumin" has been brought out by the Ultralumin A. G., Cologne. According to the maker, it is slightly lighter, of higher tensile strength and lower-priced than other aluminum alloys.

Steere cooling coils are to be built for the Sloss-Sheffield Steel & Iron Co., Birmingham, by the Semet-Solvay Engineering Corporation, New York, for use on gas scrubbers. There will be 26 stacks, 40 tubes high, zinc coated by sherardizing to resist corrosion.

Adopts Standards for Reinforcing Steel

Concrete Reinforcing Steel Institute Seeks Better Cooperation from Mills and Elimination of Ruinous Competitive Methods

ADOPTION of standard practices in the industry and the establishment of the intermediate grade as the single new billet standard for concrete reinforcement were cited as the outstanding accomplishments in the past year of the Concrete Reinforcing Steel Institute at its fourth annual convention, held March 19 to 21 at Biloxi, Miss. In pointing out these achievements, however, George E. Routh, Jr., Kalman Steel Co., Chicago, president of the institute, called attention to the fact that in some of its efforts, notably an attempt to gain the support of the mills in securing reports of tonnage and warehouse costs, the organization had been without success.

"The mills do not appreciate the possibilities of extending their market through the work of our institute," said Mr. Routh in commenting upon the situation. "We have not only been unable to enlist support and cooperation, but now the American Association of Steel Manufacturers has protested to the Department of Commerce against the adoption of intermediate as the single standard grade of new billet reinforcement. Apparently the mills look upon this standardization work from a narrow viewpoint and do not realize that they likewise benefit in direct proportion to the benefits accruing to the distributers.

"Any reduction in our fabricating costs," the speaker went on, "puts the mills and the distributers in a better position to compete with foreign steel. The attitude of the mills, to which I have referred, is typical of their attitude in many other ways. With the exception of the efforts of one large Eastern producer, none of the other mills has made an effort to cooperate in combating foreign steel, although we have repeatedly asked for their assistance. Another indication of the lack of consideration for the needs of distributers was evidenced a few months ago when the producers, without consulting us in any way, eliminated the quantity cutting extras which had been previously put in for the primary purpose of protecting the reinforcing bar distributers."

Adoption of Standard Practices

Discussing the work of the committee on standard practice, Mr. Routh stated that the institute has adopted standard contracts to cover the use of removable forms, and these contracts, in addition to the standard bar sales contract and the standard rules for bundling and tagging, have been very largely adopted by the members.

At a later session of the convention Edwin W. Ely, chief of the division of simplified practice, Department of Commerce, conferred with the institute members on the adoption of standardized form dimensions for concrete ribbed floor construction. A series of recommendations was made for adoption upon the conclusion of a referendum vote in the industry to be taken by the Department of Commerce.

At another session the joint building code which was adopted at a recent meeting of the American Concrete Institute in Philadelphia was adopted as a tentative standard by the members of the Concrete Reinforcing Steel Institute.

With the establishment of intermediate grade as the single new billet standard for concrete reinforcement, Mr. Routh pointed out that it had been necessary for the institute to conduct a campaign in the leading cities of the country to the end that building codes and other specifications should be revised in accordance with the new standard and thus obviate the necessity of carrying other grades of steel in stock. A national committee on building codes was appointed some months ago, and a considerable amount of work has been done.

"For several years," Mr. Routh said, "members have been receiving the composite tonnage reports of the institute, showing the tonnage sold and shipped, stocks on hand, average stocks and unfilled orders. These reports have been compiled long enough to indicate each month the conditions existing in the same month of the preceding year. This information is of assistance in showing the condition of the market and in guiding executives in their sales and purchase policies for the ensuing months.

"Likewise monthly composite warehouse cost reports, based upon a simple but effective system of cost accounting, have been sent to members. Of late these reports have been amended to show the 'highest' and 'lowest' costs under each operation and in each district, with warehouses grouped according to their average monthly loadings. This new arrangement of costs gives members a real basis for comparing the cost of their own operations with the warehouses of the same size."

Urges a Fair Profit

In concluding his address Mr. Routh called attention to the low profits which existed in the industry in 1927. "In the past," he said, "any improvement in conditions in the general steel business has resulted in an improvement in our profits, as we have reaped the benefits of our purchases of steel in anticipation of an increase in prices. During the past few months the steel mills have been advancing their prices, but instead of advancing our prices as the mills advance theirs and enjoying the benefits of these rising prices we are giving them to the buyer.

"The existing conditions are caused by the sellers thinking one case of sharp competition justifies a small loss. He finds that later sales bring out even lower prices, as his competitor feels he must maintain his position, so that ultimately all of the business is handled at a small or even no margin of profit.

"Is it fair when you know a competitor is close to a buyer and will be favored with the business at an equal price to quote a price lower than you would in the course of regular business, hoping to force the buyer to place the business with you against his own wishes? It is my feeling that if you cannot secure the business at an equal price it does not belong to you.

"The Sherman law operates as a barrier against the fixing of prices; against the enjoyment of a fixed profit such as accrues to railroads and public service corporations under the supervision of the State and Federal governments. There is no reason why our members cannot sell their products at a profit and still not violate the Sherman law."

What the Future Holds

In a paper entitled "Coming Changes in Industry," Dr. John T. Holdsworth, professor of economics, University of Miami, Coral Gables, Fla., outlined the development of the industrial prosperity of the country and outlined its probable future. "The great economic problem of tomorrow," he said, "is the adjustment of steadily increasing production to the needs of consumption. The lack of such adjustment is responsible for the present so-called 'profitless prosperity.' Profits are the main springs of the business mechanism. The keen business competition of recent years, bound to become more keen as time goes on, is but the stimulus to more careful, economical and scientific production and distribution. Human wants never can be wholly met and satisfied. The luxuries of yesterday are the necessaries of today. Under free democratic institutions and with constantly rising standards of living, the field of consumption ever widens. The man who, or the industry that, creates a new want and satisfies it will continue to reap rich rewards."

George E. Routh, Jr., was reelected president of the

institute for another year. Other officers were reelected as follows: C. Louis Meyer, Concrete Engineering Co., Omaha, Neb., vice-president; Hugh J. Baker, Hugh J. Baker Co., Indianapolis, treasurer; M. A. Beeman, Tribune Tower, Chicago, secretary, and R. W. Johnson, engineer. A. E. Lindau, American System of Reinforcing, Chicago, was reelected a director for three years, and O. W. Irwin, Truscon Steel Co., Youngstown, was made a director for a similar period, succeeding Gustave Kahn, of the same company.

UNEMPLOYMENT EVALUATED

Total Less Than One-Third That of 1921—Mechanization Heavily Responsible

WASHINGTON, March 26.—Workers in the United States now out of employment are estimated at 1,874,050 by Ethelbert Stewart, commissioner of labor statistics, in a report which Secretary of Labor J. J. Davis submitted today to the Senate in connection with one of his own in response to a resolution by Senator Wagner of New York. The number unemployed is declared to constitute only a small percentage of the number at work, now stated to be 23,348,692, taking into account those in either a wage or salary basis. The volume of employment tended downward from April, 1927, up to and through January, 1928, but the February report of the Bureau of Labor Statistics shows an upward trend in employment. The year 1925 is used as the basis for arriving at the shrinkage, fixed at 7.43 per cent.

Commissioner Stewart's report presents the employment situation in two parts, which consider those temporarily out of employment and those displaced by changes in industrial and commercial methods. Farm labor depressions are declared to have been due almost wholly to the first group. It was added that, if public work is not furnished quickly enough to relieve them, these men have no course but to wait until their own jobs are available again. Prompt relief here is due from the Government's elaborate building program, from similar programs of States, municipalities and counties, and from private building and construction, according to Secretary Davis. He said he had no way of "timing" seasonal employment, and that appropriations would have to be provided if more complete unemployment surveys are to be made regularly.

Based on the known number of wage earners in manufacturing and railroading in 1925, it is estimated that of the former there were 7,739,907 employed in January, 1928, and of the latter 1,643,356 in December, 1927. The manufacturing employment shrinkage since 1925 is given as 643,874 and the railroad employment shrinkage as 109,233.

The reports do not deal with the situation in separate industries. Commissioner Stewart reported that "it is not unreasonable to believe that a considerable percentage of the employment shrinkage shown in this report is due to new machines and new mechanical devices. Waiting for industrial development in these cases is of no avail. Their jobs are gone. Inventive genius must devise new industries, commercial agencies must create new wants, to provide new occupations for these people, insofar as age permits them to learn new occupations or adapt themselves to new industries."

This need for new industries and new occupations, said Secretary Davis, daily becomes more pressing. The Department of Labor was said to be in constant receipt of reports of acute situations resulting from the introduction of new machines. It is believed in many quarters, he declared, and with good reason, that mechanical development will probably proceed as rapidly in the immediate future as it has in the immediate past.

Figures of percentage of change in employment show great variation in different districts. This the Bureau of Labor Statistics interprets to mean that unemployment is not universal, nor in all places or industries is it acute, but that it is spotted by geographical sections and by industries. In actual numbers it is believed to have not more than one-third of the magnitude of the labor depression of 1921, which caused a shrinkage, according to estimates of the bureau, of 5,735,000, between the peak of 1920 and July, 1921. The greatest present shrinkage in employment, 19.7 per cent, was shown in Oklahoma, between January, 1927, and January, 1928, and the smallest in factory workers of Wisconsin, 3.9 per cent.

A tabulation shows that 79.8 per cent of all employees were in establishments that worked full-time and 87.2 per cent in establishments that worked more than 90 per cent of full-time, while less than 1 per cent of the employees are in establishments working half time or less.

In addition to the 9095 establishments in operation which reported their percentage of full-time employment, 108 establishments reported that they had recently become temporarily idle. These establishments were said to be smaller than the average, and several of them made the report during their slack season.

Production of Coal in World Was Higher in 1927

World production of coal of all grades in 1927, according to preliminary figures compiled by the Bureau of Mines, Washington, was 1,475,000,000 metric tons. Of this, approximately 197,000,000 tons was lignite and 1,278,000,000 tons was bituminous and anthracite. The lignite production was the largest on record. The United States production totaled 73,164,000 tons of anthracite and 471,556,000 tons of bituminous and lignite coal, comparing with 76,599,008 tons and 520,147,061 tons respectively in 1926. The United Kingdom was the third largest producer with an output of 259,516,600 tons of bituminous coal in 1927, comparing with 128,305,291 tons in 1926, the year of the strike, and with 247,079,210 tons in 1925.

Germany's production of 304,403,311 tons was almost equally divided between lignite (150,805,711 tons) and bituminous coal (153,597,600 tons). Both showed substantial increases over the two preceding years. No country, other than the three mentioned, reached as much as 55,000,000 tons, France being in fourth position, with 52,846,700 tons total.

Due mainly to the British strike in 1926, world production in 1927 showed a gain of 110,000,000 tons, or 8 per cent.

Wages Increase as Hours Shorten

The biennial survey of wages and hours in foundries and machine shops made by the Bureau of Labor Statistics, Department of Labor, Washington, shows that there was an increase in average earnings between 1925 and 1927 and a decrease in the average full-time hours per week. Thus, the average full-time weekly earnings in foundries increased from $31.42 in 1925 to $31.89 in 1927, while the average full-time hours per week were 51.5 in 1925, compared with 51.1 in 1927. In machine shops average full-time earnings increased from $30.34 to $31.31 per week during the two-year period, while the average week was reduced from 50.4 to 50.1 hr.

Average hourly compensation showed gains: in machine shops, from 60.2c. to 62.5c.; in foundries, from 61c. to 62.4c.

Shipments of enameled sanitary ware in February, as reported by 22 manufacturers to the Department of Commerce, totaled 295,773 pieces. This is a gain of nearly 1 per cent over January, but records a decline of 7 per cent from February, 1927. Bathtubs, at 75,663 units, show a considerable gain over the three preceding months, but a reduction of 9 per cent from February of last year.

REOPEN SOUTHWESTERN CASES

Commerce Commission Report Extends Commodity List and Changes Effective Date

WASHINGTON, March 27.—The supplemental report of the Interstate Commerce Commission in the Consolidated Southwestern cases, made public last Wednesday, grants a reopening of the proceedings relating to a number of iron and steel products. It increases the commodity description to include a list of iron and steel items not heretofore specifically named, and changes the effective date of the new rates on cast iron pipe and fittings pending possible further revision. It is provided that the rates on cast iron pipe and fittings, after July 8, 1928, shall not exceed the maximum reasonable class rates prescribed in the proceedings, subject to Western Classification ratings. One of the outstanding features of the report was a denial of the petition of the carriers for an increase of 10 per cent over the scale of rates prescribed in the original report.

The iron and steel articles to be considered in the proceedings to be reopened include wrought iron and steel pipe, riveted, seamless and welded, with fittings; cast iron pipe and fittings; iron-body well-pipe screens or strainers; spiral columns or column hoops, knocked down or collapsed; iron or steel joints for concrete road construction; castings and forgings; joists and building doors, other than rolling; studding; iron or iron body valves and siding, sash weights and wire rope.

The commodity description in the iron and steel list was amended to include the following items: expanded metal ribbing lathings; tin and terne plate; concrete and plaster reinforcement, consisting of spiral columns or column hoops, knocked down or collapsed; wire mesh and expanded metal, and wrought conduit pipe. The supplemental report on cotton ties amends the first finding by fixing the rates at 27.5 per cent instead of 25 per cent of first class. The petitions of a number of iron and steel interests to lower the scale on the general iron and steel list was denied, the 32.5 per cent scale being maintained. The commission said that it was not convinced that railroad revenues from iron and steel traffic to Texas would be increased. Undoubtedly, it was stated, the rates on many articles will be materially reduced.

The time accorded the carriers for revising rates on the numerous articles for which rates were not specifically prescribed in the earlier report was extended to Dec. 10, 1928. In order to afford time in which to publish tariffs embodying the revisions and changes in an orderly way, the effective date of the order was made July 8 instead of May 16. The new tariffs are to be posted 45 days in advance of the effective date.

A New Book on American Industry

The name of Charles M. Schwab appears as the author of a chapter entitled "Steel—Its Part in American Progress" in the volume just published for the American Institute (Edwin Forrest Murdock, president) by Doubleday, Doran & Co. Mr. Schwab's chapter consists of 20 pages which deal with developments familiar to most men in the industry. There is a two-page quotation from an address by Mr. Schwab at the Carnegie memorial service in Pittsburgh on Feb. 25, 1919. In it he spoke of Mr. Carnegie's insistence on plant of the highest obtainable efficiency and of his willingness to tear down that which did not represent the latest discovery and the most approved methods. In one case a new converting mill, which had been running only two months, was torn down and rebuilt to introduce an economy discovered after its completion.

Mr. Schwab points out that the steel industry, after spending vast sums to reduce the cost of production, has in recent years been realizing only about the same return per ton of output as before the expenditures were made. In 1913 earnings of the ten largest steel companies were equal to $6.13 per ton of ingot produced, as compared with $6.21 per ton in the three-year period 1924-26.

In referring to the penetration of steel into all departments of industrial activity, Mr. Schwab cites THE IRON AGE compilation of Jan. 5, 1928, estimating the production of finished steel in 1927 at 32,039,000 gross tons, of which the building and construction industries took 22 per cent, the railroads 19 per cent, the automotive industry 14 per cent, oil, gas, water and mining 8½ per cent, exports 6 per cent, agriculture 5½ per cent, food containers 5 per cent, machinery 4 per cent, and all other uses 16 per cent.

Among other chapters of the book are "Ships and Shipping," by Edward N. Hurley; "Foreign Trade," by Dr. Julius Klein; "Mines and Mining," by H. Foster Bain; "Railroads," by L. F. Lowry; "Machinery and Power," by Dexter S. Kimball; "The Electric Industry," by Owen D. Young; "Building Construction," by Hugh White, George A. Fuller Co.; "Labor and America's Century of Industry," by William Green.

Engineers of the World to Collaborate

WASHINGTON, March 27.—At a dinner given at the Carlton Hotel here last Thursday night by the Japanese Ambassador, T. Matsudaira, to the American committee of the World Engineering Congress, plans were made for participation of the United States at the meeting of the Congress in Tokio next year. Dr. Elmer A. Sperry, Brooklyn, elected chairman of the committee, declared that general development of industry would be facilitated through collaboration of engineers of the world. The Japanese Ambassador emphasized the debt which he said Japan owes the Western world in progress made in engineering and science.

Officers elected by the committee were: Herbert Hoover, honorary chairman; Dr. Sperry, chairman; John W. Lieb, New York, vice-chairman and chairman of the executive committee; C. E. Grunsky, San Francisco, vice-chairman (Pacific Coast); C. E. Kettering, Detroit, vice-chairman (Middle West); Maurice Holland, New York, executive secretary.

French Iron Ore Output a Record in 1927

WASHINGTON, March 20.—The production of iron ore in France in 1927, according to provisional official figures issued by the Bureau of Mines, Ministry of Public Works, reached the record figure of 44,678,415 metric tons, according to a report received by the Department of Commerce from its commercial attaché at Paris. In 1926 the output was 39,480,400 tons; in 1925, 35,741,195 tons; in 1924, 23,248,000 tons; and in 1913, 42,980,424 tons. The totals include Lorraine production. Domestic requirements are about 25,000,000 metric tons. Exports in 1927 were 14,662,382 tons.

COMING MEETINGS

April

American Oil Burner Association. April 3 to 5. Fifth annual convention, Hotel Stevens, Chicago. Leod D. Becker, 350 Madison Avenue, New York, secretary.

American Gear Manufacturers Association. April 19 to 21. Twelfth annual meeting, Hotel Seneca, Rochester, N. Y. T. W. Owen, 3608 Euclid Avenue, Cleveland, secretary.

American Society of Mechanical Engineers. April 23, 24. Meeting of materials handling division, Benjamin Franklin Hotel, Philadelphia. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

National Metal Trades Association. April 25, 26. Annual convention, Hotel Astor, New York. J. E. Nyhan, Peoples Gas Building, Chicago, secretary.

National Foreign Trade Council. April 25 to 27. Fifteenth annual convention, Rice Hotel, Houston, Tex. O. K. Davis, India House, New York, secretary.

American Welding Society. April 25 to 27. Annual meeting, Engineering Societies Building, New York. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

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This Issue in Brief

American steel industry will continue to grow steadily, says C. M. Schwab. The next 50 years will see as great an advance as took place in the past half-century, he tells Congressional committee.—Page 876.

Doubles output per man by eliminating manual handling of materials. Small-tool manufacturer reduces costs and working force, while production mounts, by handling all materials mechanically. Stock is kept constantly moving, no work piling up in process.—Page 857.

Strength and toughness of manganese steels are not affected by moderately high phosphorus or moderately high sulphur. Tests reveal that steels high in manganese content are more closely allied to structural alloy steels than to carbon steel.—Page 865.

Tests forgeability of various metals by flattening pellets under forging hammer. Pellets should be struck at various temperatures to determine relative forgeability.—Page 874.

Four-year seawater immersion test proves ingot tin most durable of 50 non-ferrous metals and alloys. Sample bars were fixed to seabottom in the Bristol Channel.—Page 874.

Steel exports fall off, while imports gain. We shipped 134,107 tons of finished steel out of the country in February, a loss of 8 per cent compared with February, 1927. We bought 30,095 tons from foreign makers, 14 per cent more than we imported in the same month of last year.—Page 885.

Production is large in relation to demand, says Dr. Haney. The P-V line predicts a downturn in the fall. Decline is attributed chiefly to the failure of commodity prices to rise, while physical volume of trade has turned upward, forecaster declares.—Page 883.

Urges German steel producers to cooperate with customers as American producers do. American consumers get the exact analysis of steel they require, and not, as in Germany, the grade the producer wishes to ship, German bolt and nut manufacturer tells trade association.—Page 888.

Government partly responsible for high cost of distribution, C. M. Schwab indicates. Government can help if it will give capital a chance to operate its business economically—for example, permitting steel manufacturers to have an understanding with each other as to where they will sell their steel.—Page 876.

Broach with detachable chromium-plated burnishing buttons is found to be best suited for boring wrist pin holes in Whirlwind engine pistons of "Y" metal. Chromium-plated tool enables airplane engine builder to increase production.—Page 869.

If you can't secure it at an equal price, the business does not belong to you, says trade association head. Underquoting a competitor who is close to a certain buyer is not only unfair but, in the long run, unprofitable as well.—Page 889.

Overheating is not especially damaging to manganese steels, investigator finds. Tests of bars quenched from a temperature 200 deg. Fahr. higher than that usually employed show that deterioration in elongation or impact value is no greater than in other alloy steels.—Page 865.

Hardness of copper is increased from 80 to 410 by adding a small percentage of beryllium. And tensile strength is increased to about 200,000 lb. per sq. in.—Page 873.

Machineability of high-manganese, high-sulphur steel is higher than that of plain carbon steel or lower-manganese steel. The first mentioned is suitable for cutting speeds higher than for open-hearth screw stock, one manufacturer says, and nearly as high as for Bessemer screw stock.—Page 866.

70:30 brass is not liable to unsoundness caused by gases, whatever the conditions of casting, British metallurgist declares after investigation. Spherical cavities frequently found in brass ingots are, in his opinion, caused by mechanical entrapping of gases within the mold rather than by gases actually in solution in the liquid metal.—Page 873.

Unemployment below two millions, Bureau of Labor Statistics reports. The figure reported is 1,874,050. Shrinkage in industrial employment since 1925 amounts to 8.3 per cent, due almost wholly to mechanization. Need for new industries daily becomes more pressing, says Secretary Davis. — Page 890.

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The New Unemployment

THE high-wage doctrine of recent years has rested on the premise that mass production demands mass consumption. On the one hand, management and technical staff have been steadily cutting manufacturing costs; on the other hand, wage rates have been maintained and buying power expanded through instalment selling—all in an effort to develop a market large enough to absorb the accelerated output of large-scale repetitive processes. Unfortunately, cost reduction has caused a steady decline in the number of workmen required for a given output. While those employees retained are commanding unchanged, and in some cases even advanced, wages, an increasing number have been released to find employment elsewhere. A new kind of idleness, "technological unemployment," has made its appearance. Technological advances in industry, while cheapening production, are reducing the number of buyers so essential to the maintenance of mass consumption. Shall we say that industrial efficiency has created a Frankenstein which is starting in to destroy?

Frequently the initial effect of labor-saving equipment is to cause distress among the workmen displaced, although the ultimate gains have always outweighed temporary disadvantages. Following the World War and the restriction of immigration, however, the shortage of man power put a premium on the mechanization of industry. So rapid were the strides in this direction that what had been a serious deficiency of labor now appears to have been converted into a surplus.

At the moment unemployment seems to be less serious than late last year; it is a curious fact, indeed, that its magnitude did not become apparent until some time after it had passed its worst. This is possibly testimony to the fact that much of the enforced idleness of workmen was due to technological causes rather than to business depression. The condition stole on the country unawares, as it were.

That technological unemployment presents a problem of prime importance is not yet clear. The growth of luxury industries and various forms of personal service, made possible by increased consumer buying power, have been taking surplus labor, but the diversion of workmen into these pursuits apparently has failed to keep pace with the release of man power through gains in efficiency.

In some industries, notably in textiles, there have been recent reductions in wages. No general trend in that direction has developed, and some of the leading industrial companies of the country are opposed to any such move. They are concerned not only with preserving mass buying power but with keeping all important business factors stable. A collapse of the wage structure would bring an industrial depression of first magnitude.

It is this desire for business stability that has caused so much interest in the initiation of public work as a means of relieving unemployment. One difficulty with municipal, county, State or Federal undertakings is the slowness with which they ordinarily get under way. Legislative authorization of appropriation, votes on bond issues, the making of plans, the getting of bids, etc., all take time and frequently delay the actual starting of such work until the motivating emergency is past.

Another measure in the interest of labor stabilizing is unemployment insurance. So far this remedy has been tried chiefly in Europe. It has not found favor in this country because of its paternalistic character. Whatever steps are taken to cope with unemployment, it is essential first to obtain more accurate statistics regarding the number of unemployed. Existing data are so incomplete that estimates vary by the millions. Comprehensive, dependable statistics upon which a national employment index might be based would replace guesses with facts.

PRESSED steel highway signs bearing "Stop" and other directions, including warnings at railroad crossings for automobilists, have come into general use in a number of States in the past two years and have opened another field for the output of stamping plants. The signs are made of 16 or

18-gage sheets, and the processes of manufacturing, including embossing, enameling and inking of the letters, are practically the same as those employed in making automobile license plates. Signs standardized in form and size have been adopted to some extent. The steel signs take the place of wood and cast iron. Their superiority to wood is obvious. Claimed advantages over cast iron signs include cheapness, less danger of breakage, and lightness, which makes them easier to transport and erect. It is estimated that 500 tons of sheet steel was used in the manufacture of road signs of this type last year.

The Steel Corporation's Share

STEEL CORPORATION production of steel ingots decreased by 9 per cent from 1926 to 1927; its production of finished lines decreased 9.5 per cent and its shipments 9.1 per cent. Total earnings, after taxes but before any bond interest, fell off 16.9 per cent, thus reflecting a decrease in earnings per ton shipped, while earnings available for dividends decreased 24.7 per cent.

Comparing last year with 1925, however, there was a decrease of less than 1 per cent in total earnings but a decrease of 3 per cent in shipments. Thus in return per ton 1927 proved a shade better than 1925. Last year was handicapped by the very poor fourth quarter, when realized prices were distinctly below the year's average. Total earnings and profits per ton were somewhat better in the first three quarters of last year than they were in 1925 as a whole.

The significance of the comparison is simply this, that while the relatively poor showing of 1927 can be partly explained away, the poor start it furnished for 1928 stands out prominently. The steel industry greatly needed the price advances it since has striven to put into effect. That they are not in full force on current shipments is only what was to be expected in the light of experience. The last general and important rise in steel prices was completed early in 1923, and in 1924 prices declined, yet the Steel Corporation had distinctly larger earnings relative to tonnage in 1924 than in 1923.

The corporation's report gives the operation in 1927 at 78.9 per cent of capacity, which compares with 88 per cent for 1926, 78.4 per cent for 1925, 70 per cent for 1924 and 88.3 per cent for 1923. Last year's percentage was just a trifle under the average of the four preceding years. Capacity was slightly larger, while the proportion of Steel Corporation production to total production of the industry decreased slightly, being 43.3 per cent in 1927 against 46.8 per cent in 1923.

The corporation got along with less raw material in 1927, percentage variations in production from 1926 being as follows:

	Per cent Decrease.
Iron ore mined	12.4
Coke manufactured	16.3
Blast furnace production	12.2
Steel ingot production	9.0

In finished steel production, with a total decrease of 9 per cent, from 14,334,412 tons in 1926 to 12,979,282 tons in 1927, the largest decrease was in rails, 16 per cent; bar mill products followed with 14 per cent. The smallest decreases were in tubing and pipe, 3.8 per cent and in wire products, 3.6 per cent. The small decrease in wire products, which are quite a staple, seems natural; but to find tubing and pipe holding up so well is certainly surprising. That 1926 was an exceptionally active year in oil and gas well drilling and 1927 an extremely poor year has been generally said and fully credited. A very interesting comparison with the pipe and tube total is due when the official statistics of the industry are published.

Rest Pauses in Industry

IN establishing the rest period in shop work, to increase efficiency and output by correcting the effects of fatigue, it is not sufficient arbitrarily to fix the length of the recess at a certain number of minutes. Each industry, in fact each plant, has its own problem to solve as to the frequency and length of pauses, according to a report of the Industrial Fatigue Research Board of Great Britain. The board finds that the introduction of frequent rest pauses lessens the feeling of fatigue among the workers and tends to increase the output, even though the working time is less.

Each establishment, to secure efficient results, must consider the character of its work in relation to fatigue, whether from bodily exertion or from mental stress which comes with concentration and from such influences as that of extremely monotonous tasks. A rest period may be so short that it is only an irritation to the worker, or it may be so long that it is difficult for him to resume his labor with the same drive he had before dropping it.

The board points out that in most occupations the workers themselves introduce pauses. Tin plate workers take from twelve to fourteen minutes rest each hour. But the research indicates that voluntary pauses are not so advantageous in procuring high production as authorized rest. In one cited case the substitution of prescribed for voluntary rest pauses increased the output more than 4 per cent. In another case it was found that workers taking spontaneous rests turned out sixteen pieces per hour; when working twenty-five minutes and resting five they produced eighteen pieces; when working seventeen minutes and resting three they produced twenty-two pieces; and when working ten minutes and resting two they produced twenty-five pieces per hour. The output increased with the frequency of the pauses.

In one experiment rest periods of one-half minute, two minutes and five minutes were used after a work period of forty minutes. The two-minute pause was found to be most beneficial. In another test five minutes rest was found to be better than one minute, three or ten minutes, after eighty minutes of work. In still another a rest of fifteen minutes in the middle of a work period of one hour had an unfavorable effect upon output.

Stress is put upon the use the employee makes of his rest pauses. Physical and mental relaxation are sought. In one American plant cots are provided and the workers lie down for a certain number of minutes, often going to sleep. Nothing so

quickly restores strength as to relax in a prone position, and a short nap is a great restorer of vitality, bodily and mental. Many busy executives have learned the value of this, making it a rule to stretch out for a few minutes, perhaps snatching a nap, as a break in their business day. As a rule, the worker in his rest period should assume a posture the opposite of that which his labor compels. If he stands to his task, he should sit or lie down. If his occupation requires him to sit, he should stand and perhaps walk about during his recess.

Value of Low-Manganese Alloy Steels

REFERENCE has been made recently in these columns to the fact that manganese is gradually living down a questionable reputation as an element in low-alloy steels. Steel castings, carrying considerably more manganese than is ordinarily present, have long been known to have superior physical properties when proper care is taken to prevent segregation and to break up dendritic crystallization. Carburizing steel popularly known as S.A.E. 1315 X, containing 0.10 to 0.20 carbon, 0.08 to 0.13 sulphur and 1.25 to 1.55 manganese, has also been marketed. Some users like it, others not at all. It has been said that a basic open-hearth steel, if low in sulphur and containing more than 0.8 per cent manganese, will never act "abnormally" in the carburizing pot. Furthermore, acid open-hearth steels containing 0.25 to 0.50 carbon and about 1.0 per cent manganese have been successfully marketed in competition with higher alloy steels, and are now being vigorously exploited under different trade names.

This last classification, known to metallographists as pearlitic manganese steel, is described fully in a paper by Jerome Strauss in this issue of THE IRON AGE. Well over a thousand tons of it have been used by the Naval Gun Factory recently. Under ballistic tests artillery shells do not split; if they cannot penetrate the armor they merely mash out of shape. This is certainly good indication that well made manganese steel, properly heat treated, has none of that brittleness which has commonly been assumed.

Such a searching test in practice is more convincing than the good results on Izod impact specimens reported by Mr. Strauss. On the whole, his tests indicate a material which should be of great service for machined parts requiring higher strength and toughness than medium carbon steel, yet hardly warranting the more expensive steels containing nickel, chromium, molybdenum, or a combination of them.

While the reported tests on manganese steels unduly high in sulphur or phosphorus are interesting, a warning should be given against placing too much reliance just yet upon the ability of manganese to counteract the expected deterioration from these impurities, in addition to enhancing the physical properties due to carbon. Let us take one thing at a time. Several metallurgists still remember unhappy experiences with manganese steels in as diverse forms as thin tubular sections, coiled springs and heavy armature shafts. Failures seemed to be associated with large pearlitic grains, considerable chemical segregation and even seaminess and excessive silicate inclusions.

Without shutting one's eyes to these undoubted facts, it is only fair to remark that much has been learned in recent years about the control of grain size in fairly massive forgings. Furthermore, several steel makers have studied the low-manganese steels sufficiently to have developed a correct furnace refining practice, to have discovered the proper relationship of ingot mold and cooling rate, and corrected the adjustment of carbon to manganese, with the result that the steels now made are much superior to those turned out without particular care several years ago. The inverse relationship between carbon and manganese is especially important. To prevent brittleness and excessive machining costs, the carbon must be 0.30 or lower as the manganese passes 1.75 per cent.

Simplifying Rolling Mill Design

MANUFACTURERS who have taken up in a comprehensive way the simplification of their products, following the modern trend toward standardization and the throwing out of unprofitable lines, have profited in a large way by their enterprise. This is true in particular of older houses, whose products represent a long evolution in mechanical design, in sizes and in uses. A house-cleaning on well-studied engineering lines is quite sure to result in a large measure of simplification and consequent reduction in costs.

A typical experience is that of one of the great American builders of rolling mill and wire-making machinery. For the last three years the company has maintained a special department to study in the lines mentioned. Its activities have contributed largely to a 58 per cent reduction in inventories.

The proper selection and simplification of materials has been of vast importance in keeping machines working with the least confusion and change. Many designs of machines specified by the steel trade are called for too infrequently to warrant their manufacture. These have been eliminated.

Roll housings were formerly built in 50 different sizes and types. The number is now reduced to two types, with 12 sizes in each type, or 24 in all. Pinion housings were formerly built in three types requiring 30 different sizes. The company now puts out one type which comes in 12 sizes. This procedure is being applied to the entire product of the company, so that specific sizes and types are prescribed for all machines. As a result, materials for service requirements can be easily stocked. Repair orders will be filled more promptly. The cost and storage of patterns are reduced and there is also a lowered cost for jigs and fixtures.

The greatest saving brought about has been in the decrease in inventory. For instance, mill construction calls for quantities of angles. Formerly, to meet the requirements of many sizes and many types for each machine produced, it was necessary to carry in stock 74 different sections. Under the present practice it is necessary to carry only 11 sections and all new developments must conform to the revised standards.

For Large Scale Manufacture of Steel Sanitary Fixtures

The Steel Sanitary Co. has been organized at Alliance, Ohio, to manufacture from enameled and stainless sheet steel a full line of sanitary fixtures, including bath tubs, lavatories, sinks and laundry tubs. The plans contemplate operations at Alliance and the turning out of 1200 enamel steel and 400 stainless steel sanitary fixtures daily. The enterprise is the result of a development by J. C. Cromwell, applying mass production methods to the utilizing of sheet steel in the sanitary field, now almost entirely occupied by cast iron.

The officers of the new company are the following: Chairman of the board, W. H. Purcell, president Alliance Machine Co. and other Alliance corporations; president and treasurer, F. E. Dussell, president and treasurer Buckeye Twist Drill Co. and formerly president of the Transue & Williams Steel Forging Corporation Alliance; general manager, J. C. Cromwell, formerly of the Garrett-Cromwell Engineering Co., Cleveland.

It is estimated that 300,000 tons of steel would be required each year if the entire sanitary industry were converted from cast iron to steel. This equals the amount of steel now consumed in the metal furniture industry. Previous attempts to produce sanitary ware of steel failed because of small scale operations and uneconomical methods, which resulted in higher costs than for cast iron ware. With the production methods devised by Mr. Cromwell the organizers of the new company expect to produce steel ware on a basis competitive with cast iron. The methods and processes are covered by patents. The materials employed will include steel sheets having special analysis and treatment and also special stainless enamel, both white and colored.

Gain of 8½ Per Cent in Two-Months Exports of Industrial Machinery

WASHINGTON, March 26.—Exports of industrial machinery from the United States in February, according to the industrial machinery division of the Department of Commerce, totaled $15,053,902, practically the same as in January, despite the fact that February was the shorter month. Exports in February of last year amounted to $12,643,669. For the two months ended February of the current year and correspondingly last year they were $30,169,059 and $27,821,315 respectively.

Shipments of metal-working machinery made the best showing in February, with a value of $2,372,864, as compared with $1,406,142 in February of last year, a gain of 69½ per cent. The largest gains in this group were made in engine lathes, thread-cutting and automatic screw machines, gear-cutting machines and cylindrical grinding machines. In the construction machinery group exports of excavators, including power shovels, amounted to $607,869 in February, against $287,733 for the corresponding month of 1927, and shipments for the two months were valued at $1,117,000, or nearly double the figure for the same period of last year.

Exports of freight and passenger elevators, on the other hand, declined from $150,569 to $23,810, based on the monthly comparison, and from $209,183 to $126,506 for the two-month periods. Exports of the entire construction group, however, were in excess of those of February, 1927, the values being $1,506,281 and $1,293,117 respectively. For the two months ended with February the total was $3,132,317, against $2,547,605 for the corresponding period of last year. Exports of textile machinery in February amounted to $1,397,930, against $1,079,837 in February of last year. For the two months ended with February the value was $3,131,975, compared with $2,438,758 for the corresponding period of last year.

Exports of miscellaneous industrial machinery in February were valued at $6,682,252, against $4,787,234 in February, 1927. For the two months of each year the values were $12,352,593 and $9,948,846 respectively.

Princess Blast Furnace in Virginia to Be Sold at Public Auction

The blast furnace and all other property of the Princess Iron Corporation at Glen Wilton, Va., will be offered for sale at public auction Saturday, April 7, at 11 a. m. at the office of the company at Glen Wilton. The sale has been ordered by the United States District Court for the Western District of Virginia in a pending action brought by the Bank of North America & Trust Co., Philadelphia.

The Princess furnace was built in 1883-84 and rebuilt in 1912. Its brand of pig iron at one time enjoyed a wide reputation throughout the East. The furnace has not been operated during the last few years. Its annual capacity is 36,000 tons.

United States Exports of Industrial Machinery

Class	February 1928	February 1927	Two Months Ended February 1928	Two Months Ended February 1927
Power-generating, except electric and automotive:				
Steam engines(a)	$423,473	$586,087	$1,009,137	$1,706,389
Internal-combustion engines(b)	478,532	604,336	1,090,944	1,374,161
Water wheels and turbines	42,120	.....	52,619	20,991
	$944,125	$1,190,423	$2,152,700	$3,101,541
Construction and conveying machinery	1,506,281	1,293,117	3,132,317	2,547,605
Mining, oil-well and pumping machinery:				
Mining and quarrying	1,024,523	1,069,586	1,960,918	2,205,639
Well-drilling	380,469	649,895	956,500	1,622,547
Other oil-well and oil-refining	418,426	785,152	907,408	1,790,115
	$798,895	$1,435,047	$1,863,908	$3,412,662
Pumping, power (c)	287,032	382,283	663,417	913,822
	$2,110,450	$2,886,916	$4,488,243	$6,532,123
Metal-working machinery:				
Power-driven	1,940,147	1,121,256	4,029,949	2,615,383
Other	432,707	284,886	881,282	637,060
	$2,372,864	$1,406,142	$4,911,231	$3,252,443
Textile, sewing, and shoe machinery:				
Textile	921,642	721,241	2,137,989	1,746,443
Sewing, industrial	343,297	283,982	691,602	518,677
Shoe	132,991	74,614	302,384	173,635
	$1,397,930	$1,079,837	$3,131,975	$2,438,755
Other industrial machinery (d)	6,682,252	4,787,234	12,352,593	9,948,848
Total	$15,053,902	$12,643,669	$30,169,059	$27,821,315

(a) Excludes locomotives.
(b) Excludes engines not over 10 hp.
(c) Excludes windmill pumps, also parts of pumps.
(d) Excludes domestic washing machines; includes mine cars.

Iron and Steel Markets

Price Trend Mixed as Output Gains

Pittsburgh District Steel Production at 85 Per Cent Compared with Recent Average of 80 Per Cent—Tin Plate Output Expands—Shading in Sheets and Nails—Pig Iron Weaker

HEAVY steel output is being maintained and, in some districts, notably at Pittsburgh, is showing further gains, but the trend of prices is no longer upward and irregularities in quotations are more numerous. The opportunity to reduce costs with a high rate of operations has, no doubt, influenced mills to accept additions to contracts at lower than prevailing prices or to shade the market on spot business.

Prices of sheets, strips and wire nails are increasingly irregular. Underlying the finished steel market is an unpromising situation in the primary materials. The scrap and coke markets have a weak tone, and in some sectors pig iron prices are commencing to give ground.

The Steel Corporation is again operating at a 90 per cent rate after having dipped to 88 per cent. Its subsidiary, the Carnegie Steel Co., has lighted three blast furnaces during the week, now having 34 of its 50 stacks active. For both Corporation and independent plants in the Greater Pittsburgh district, steel ingot output now averages 85 per cent, as against 80 per cent two weeks ago. Contributing to improved output of raw steel has been a gain in tin plate mill operations, the current average being 90 per cent of capacity compared with 85 per cent last week.

New orders for finished steel are comparatively light, but, with some mills advising their trade that unspecified tonnage on contracts will be cancelled March 31, specifying is in larger volume. However, there has been less of a rush to enter specifications than was expected; in the Cleveland district, buyers whose plants are not busy are permitting their contracts to lapse.

Nevertheless, much of the steel that will be shipped in April will be at first quarter contract prices, thereby deferring a severe test of recent advances for several weeks more. In a few products the price issue has already been raised. Irregularities in black sheets are increasingly numerous, with some producers taking business, at least temporarily, at $1 to $2 a ton below the recent ruling quotation of 2.90c. per lb., Pittsburgh. Concessions of $2 a ton from 3.75c. on galvanized sheets have been made by both mills and jobbers.

Two producers of wire nails have notified middlemen that they will cancel first quarter tonnage not specified by March 31. Jobbers, however, are heavily stocked and sales of retailers' carloads have been made at $2.60, base per keg, or $1 a ton below the mill quotation on new business.

Price concessions of $2 a ton are reported on hot-rolled strip apart from cooperage stock, and one of the smaller makers of cold-rolled strip has announced a reduction of $3 a ton for second quarter, going back to the prices at which most contracts for the current quarter were made.

Leading Pittsburgh makers of track spikes have discontinued taking orders for less than a carload and have advanced carload prices $2 a ton to $2.80 per 100 lb.

The automotive industry is expected to keep up its present high rate of production through April, with good operations in sight at least through May. There is a heavy demand for steel from motor car builders, but they are ordering cautiously—as a rule only far enough ahead to assure a steady flow of materials from the mills.

Heavy backlogs in rails have been augmented by 18,000 tons placed by the Great Northern. The Gary mill took half of the tonnage, while the Inland and Bethlehem companies booked 4500 tons each. Another Western road which placed a contract in the winter has ordered 4000 tons additional.

Steel mills will furnish about 15,000 tons of steel for 1000 car bodies bought by the Chicago & North Western and 200 ore cars ordered by the Chicago, Milwaukee, St. Paul & Pacific. The latter road has still to buy 4650 freight cars. The New York Central is inquiring for 119 passenger cars, and, according to an unconfirmed report, the Pennsylvania will enter the market for 10,000 to 12,000 freight cars.

A contract for laying a pipe line from Amarillo, Tex., to Kansas City, Mo., has been awarded, but the steel, amounting to 100,000 tons, has not yet been placed.

A bridge over the Delaware River near Philadelphia and an apartment building in New York, each requiring 8000 tons, account for about half of the structural steel work added to pending projects. Awards amounted to 22,400 tons, one of the lowest totals for any week this year. Orders were placed for 13,000 tons of reinforcing steel bars.

Basic pig iron has been sold by a Pittsburgh district producer at more than $1 a ton below the delivered price of Valley iron based on $17 at Valley furnace. Buffalo foundry iron in the New England and New York markets has declined to a base price of $16, furnace, and the delivered prices on Buffalo iron to water points are setting a pace for competitive furnaces because of low canal barge rates. In the Boston market the local producer has met the low quotations of Buffalo iron.

Exports of iron and steel in February were 185,915 tons, a decline from 205,766 tons in January, but higher than the 166,129 tons of February, 1927. The gain from a year ago was more than accounted for by increased shipments of scrap.

Both of THE IRON AGE composite prices have declined, that for pig iron to $17.67 from the $17.75 held for six weeks and that for finished steel to 2.357c. a lb., from the 2.364c. of the preceding six weeks. Both are still well above the year's low figures.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Mar. 27, 1928	Mar. 20, 1928	Feb. 28, 1928	Mar. 29, 1927
No. 2 fdy., Philadelphia	$20.76	$20.76	$20.76	$21.76
No. 2, Valley furnace	17.25	17.25	17.25	18.50
No. 2, Southern, Cin'ti	19.69	19.69	19.69	21.69
No. 2, Birmingham	16.00	16.00	16.00	18.00
No. 2 foundry, Chicago*	18.50	18.50	18.50	20.00
Basic, del'd eastern Pa	19.50	19.50	19.50	20.75
Basic, Valley furnace	17.00	17.00	17.00	19.00
Valley Bessemer, del. P'gh	19.26	19.26	19.26	21.26
Malleable, Chicago*	18.50	18.50	18.50	20.00
Malleable, Valley	17.25	17.25	17.25	18.50
Gray forge, Pittsburgh	18.51	18.51	18.51	19.76
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	100.00	100.00	100.00	100.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	34.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	34.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	34.00
Forging billets, P'gh	38.00	38.00	38.00	40.00
O.-h. billets, Phila	38.30	38.30	38.30	39.30
Wire rods, Pittsburgh	44.00	44.00	44.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.12
Iron bars, Chicago	2.00	2.00	1.90	2.00
Steel bars, Pittsburgh	1.85	1.85	1.85	1.90
Steel bars, Chicago	2.00	2.00	1.95	2.00
Steel bars, New York	2.19	2.19	2.19	2.24
Tank plates, Pittsburgh	1.85	1.85	1.85	1.85
Tank plates, Chicago	2.00	2.00	1.95	2.00
Tank plates, New York	2.17½	2.17½	2.17½	2.19
Beams, Pittsburgh	1.85	1.85	1.85	1.90
Beams, Chicago	2.00	2.00	1.95	2.00
Beams, New York	2.14½	2.14½	2.14½	2.19
Steel hoops, Pittsburgh	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Mar. 27, 1928	Mar. 20, 1928	Feb. 28, 1928	Mar. 29, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.85	2.90	2.90	2.75
Sheets, black, No. 24, Chicago dist. mill	3.00	3.00	3.00	2.95
Sheets, galv., No. 24, P'gh.	3.65	3.65	3.65	3.65
Sheets, galv. No. 24, Chicago dist. mill	3.85	3.85	3.85	3.85
Sheets, blue, 9 & 10, P'gh	2.10	2.10	2.10	2.20
Sheets, blue, 9 & 10, Chicago dist. mill	2.20	2.20	2.20	2.35
Wire nails, Pittsburgh	2.65	2.65	2.65	2.55
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.25
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.30
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh.	**$15.00**	$14.75	$14.75	$16.75
Heavy melting steel, Phila.	13.50	13.50	13.50	14.50
Heavy melting steel, Ch'go	12.50	12.50	12.75	13.25
Carwheels, Chicago	*13.50*	14.00	14.00	15.00
Carwheels, Philadelphia	15.50	15.50	15.50	16.00
No. 1 cast, Pittsburgh	14.50	14.50	14.50	16.00
No. 1 cast, Philadelphia	16.00	16.00	16.00	17.00
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	16.50
No. 1 RR. wrot. Phila.	15.00	15.00	15.00	17.00
No. 1 RR. wrot. Ch'go (net)	11.00	11.00	11.00	12.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.60	$2.60	$2.60	$3.25
Foundry coke, prompt	3.75	3.75	3.75	4.25
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*14.20*	14.25	14.20	13.37½
Electrolytic copper, refinery	14.00	14.00	13.75	12.87½
Zinc, St. Louis	5.72½	5.72½	5.45	6.52½
Zinc, New York	6.07½	6.07½	5.80	6.87½
Lead, St. Louis	**5.82½**	5.80	5.90	7.10
Lead, New York	6.00	6.00	6.15	7.35
Tin (Straits), New York	**52.75**	52.00	51.75	68.00
Antimony (Asiatic), N. Y.	*10.00*	10.25	10.25	14.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Output of 85 Per Cent Maintained —Some Price Irregularity

PITTSBURGH, March 27.—Production of steel ingots in this and nearby districts is around 85 per cent of capacity. All companies are not operating that well, but a few are running considerably above that rate and one company with an annual capacity of around 1,000,000 tons probably will produce more than 90,000 tons this month. March is usually a month of high production and this year will be no exception. March pig iron production also will be heavy, not only because of additions to the list of active stacks but because many of the large furnaces are being pushed to the limit. One furnace in the district will produce close to 30,000 tons, if, indeed, it does not exceed that mark.

Except that the movement of finished steel from the mills got under way a little earlier than it did last year, there is a remarkable similarity in the performances of this year and last. April, however, promises to show less of a recession than that month last year, although the expectation is not strong that next month's specifications will be as large as they have been this month.

Prices still show much irregularity, with comparatively little of the business carrying the full or top quotations. The effort is being made to preserve the advance by some, but the more general condition is that steel manufacturers are desirous of avoiding price resistance.

The steel industry has no reason for complaint over the volume of orders and specifications, and it is still operating at a rate that insures producing costs as low as are physically possible. This combination of conditions partially counterbalances the fact that it has not been overly successful in securing the advances it set out to obtain during the early weeks of the year.

Confidence would be greater if the railroads were in a position to buy more rolling stock. The St. Paul inquiry for 4650 cars is the largest business of this sort now in sight, although the Pennsylvania is said to be getting ready to put out a good-sized inquiry, despite the fact that an official of that road recently said it would not need cars this year.

Low prices are being made on steel-making iron on sales between steel companies, but merchant iron is held at the prices that long have been observed. Dealers having short orders in heavy melting steel scrap are getting anxious to cover and are raising their bids under increased pressure from the melters for deliveries. The strength of compressed sheet scrap still is a feature of the situation. The fuel market is featured by some good-sized orders and inquiries for coking coal.

Pig Iron.—A Pittsburgh district steel company has closed for a round tonnage of basic iron and a smaller tonnage of Bessemer iron for a steel foundry which it operates, but no details as to prices are available. The iron, however, will not come from Valley furnaces, the transaction being another demonstration of the fact that Valley steel-making iron cannot be brought into the Pittsburgh district in competition with Pittsburgh district steel company iron, which enjoys a substantially lower rate of freight for one thing, and for another, the steel companies with surplus iron for market not infrequently pass on to buyers more than their freight rate advantages. In the case of the basic iron, there are reports that it sold at $15.87, Valley furnace

basis, which would mean $17.63, delivered, but it is probably nearer the facts that the iron carried a freight rate of $1.13 and the price at shipping furnace was $16.50. It was noted in these reports a fortnight ago that while Valley furnaces were still quoting $17 for this grade, they would have to go to about $16 to meet local competition. An inquiry in the market is for 5000 tons of basic iron of special analysis, but it is believed to be for shipment outside the natural territory of Pittsburgh or Valley furnaces. Except for this business, the market has been extremely quiet, with only small lots of Valley iron moving, and these at the prices which have ruled for some time. The Carnegie Steel Co. has put on a Duquesne, a Carrie and an Isabella furnace within the week and now has 34 of its 50 stacks in production.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	17.50
Gray forge	16.75
No. 2 foundry	17.25
No. 3 foundry	16.75
Malleable	17.25
Low phosphorus, copper free	27.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Business is entirely a matter of specifications on contracts, as there are few, if any, users of ferromanganese, spiegeleisen, or high grade ferrosilicon who are not covered. So far as can be learned, not a carload of high grade ferrosilicon has been billed to consumers in this district at the higher prices which makers announced early in the year.

Semi-Finished Steel.—As open market trading in billets, slabs and sheet bars has largely ceased and the movement is mostly on requirement contracts of indefinite duration between consumers and makers, there are no tests of what are commonly regarded as the market prices. For more than a year, mills have called the market $33, Pittsburgh or Youngstown, for large billets and slabs, and $34 for sheet bars and small billets and slabs, but as in that time there has been wide variation in the prices of most of the finished products, it is assumed that the contracts are flexible as to prices as well as duration. Wire rods are nominal at $44, base. There has not been much contracting at that price, buyers having some doubt as to its maintenance, and this feeling has increased since some makers are accepting increased specifications on first quarter contracts carrying $2 to $4 a ton less.

Rails and Track Supplies.—Leading local makers of spikes have announced that they no longer will take orders of less than a carload and at the same time have placed the carload price at $2.80, base, per 100 lb. for all sizes. This represents an advance of $2 a ton, as the ruling price has been $2.70, and restricting that price to a minimum of a carload means a stiffer advance to small-lot buyers, who have been able to buy at the mill prices. Standard-section rails and track supplies continue to move well on old orders, but not much new business is coming in. Light-section rails still are very dull.

Wire Products.—Two producers are notifying jobbers that after next Monday no business in nails will be accepted at less than $2.65, base, per keg Pittsburgh. In other words, first quarter business not specified by Saturday is to be cancelled. So far as can be observed, however, this action has not materially stimulated second quarter contracting, as jobbers generally are well stocked and are not much concerned about additional coverage in view of the fact that the movement into consumption has not been particularly brisk. Some resistance to the price also is being encountered, as jobbers who would go along with the advance find considerable competition in the resale prices; sales of retailers' carloads have been made at $2.60, base. It is said the extra of $1 a ton over Pittsburgh is not being closely adhered to in the Central West, and price irregularity is reported in the East and South. There is resistance by consumers of plain wire to $2.50, base, per 100 lb. General business is regarded as satisfactory by most producers, but price uncertainty is disturbing.

Tubular Goods.—Pipe for building and construction is moving steadily into consumption and jobbers are replacing shipments, but the market lacks activity in other classes of tubular products. The oil industry still struggles with overproduction. Some good-sized pipe line projects appear to be held up by legal or financial obstacles. Mills are interested in the suggestion of a possible stiffening of secondary market prices, since such a large percentage of the standard-weight pipe is distributed on consigned accounts and makers would benefit by higher resale prices. Evidence, however, is lacking here that the movement yet is nearing accomplishment.

Sheets.—There has been much less than the usual amount of contracting for the second quarter in the common finishes, and in view of the high engagement of mills, it is becoming apparent that what has happened in a number of other products, is happening in sheets—there is either extension of existing contracts or additions to them are being accepted. While the full quotations of 2.90c., base, on black, 3.75c., base, on galvanized and 2.10c. to 2.20c., base, on blue annealed have been paid for small pick-up tonnages for quick shipment, a good deal heavier tonnage is moving on the basis of first quarter commitments. The market is better maintained on blue annealed than on galvanized and black sheets, but the weakness in strips is not conducive to strength in blue annealed sheets 40 in. and narrower. Galvanized sheets are being sold in small lots by jobbers in some parts of the country at 3.65c., base, Pittsburgh, which, of course, makes mill sales difficult at more in those localities. Specifications have been lighter in the past week than in the week before, which suggests that consumers are fairly well stocked.

Tin Plate.—Mill operations continue to expand and the leading producer now is operating at 93 per cent of capacity, while the general average of operations is not under 90 per cent. That compares with approximately 85 per cent last week. The prospect continues bright for a large use of tin plate in packers'

The Iron Age Composite Prices

Finished Steel

March 27, 1928, 2.357c. a Lb.

One week ago	2.364c.
One month ago	2.364c.
One year ago	2.367c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

March 27, 1928, $17.67 a Gross Ton

One week ago	$17.75
One month ago	17.75
One year ago	19.13
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.75,	Feb. 14;	$17.54,	Jan. 3
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

SIDE GUIDE & GRIPPER

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	2.04c. to 2.09c.
F.o.b. Cleveland	1.85c. to 1.90c.
F.o.b. Lackawanna	1.95c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c. to 2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.75c.
F.o.b. Chicago Heights mill	1.80c. to 1.85c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.10c. to 2.15c.
F.o.b. Coatesville	2.00c. to 2.05c.
F.o.b. Sparrows Point	2.00c.
F.o.b. Lackawanna	1.95c.
Del'd New York	2.17½c. to 2.22½c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
F.o.b. Lackawanna	1.95c.
F.o.b. Bethlehem	2.00c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.12c. to 2.18c.
Del'd New York	2.14½c. to 2.19½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh	2.20c. to 2.40c.
Wider than 3 in. to 6 in., P'gh	2.10c. to 2.20c.
6 in. and wider, P'gh	*1.90c. to 2.00c.
Narrower than 3 in., Chicago	2.30c. to 2.50c.
From 3 to 6 in., Chicago	2.20c. to 2.30c.
6 in. and wider, Chicago	2.00c. to 2.10c.

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh,	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.15c. to 3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galvanized nails	4.65
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, gal'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mills $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb
Nos. 9 and 10, f.o.b. P'gh—wider than 40 in.	2.20c.
Nos. 9 and 10, f.o.b. P'gh—40 in. and narrower	2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill,	2.20c. to 2.30c.
Nos. 9 and 10, del'd Cleveland	2.29c.
Nos. 9 and 10, del'd Philadelphia	2.42c. to 2.52c.
Nos. 9 and 10, f.o.b. Birmingham	2.25c. to 2.30c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.80c. to 2.90c.
No. 24, f.o.b. Chicago dist. mill	3.00c.
No. 24, del'd Cleveland	2.94c. to 3.09c.
No. 24, del'd Philadelphia	3.22c.
No. 24, f.o.b. Birmingham	3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.75c. to 3.85c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.65c. to 3.75c.
No. 24, f.o.b. Chicago dist. mill	3.85c.
No. 24, del'd Cleveland	3.74c. to 3.94c.
No. 24, del'd Philadelphia	4.07c.
No 24, f.o.b. Birmingham	3.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.15c.

Long Ternes

No 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. maker's mill.)

S.A.E. Series Numbers		Per 100 Lb.
2000	(1½% Nickel)	$2.90
2100	(1¾% Nickel)	3.20
2300	(3½% Nickel)	4.15
2500	(5% Nickel)	4.90
3100	Nickel Chromium	3.20
3200	Nickel Chromium	3.65
3300	Nickel Chromium	6.45
3400	Nickel Chromium	5.85
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	3.15
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	3.35
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	3.70
5100	Chromium Steel (0.60 to 0.90 Chrome)	3.00
5100	Chromium Steel (0.80 to 1.10 Chrome)	3.10
5100	Chromium Spring Steel	2.85
6100	Chromium Vanadium Bars	3.85
6100	Chromium Vanadium Spring Steel	3.60
9250	Silicon Manganese Spring Steel	2.90
	Chrome Nickel Vanadium	4.15
	Carbon Vanadium	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.90
Track bolts, to jobbers, all sizes, per 100 count,	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	1
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	1
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	13
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	1
2½ to 4	57	46½	2½ to 4	29	18
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	18
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5 and 2½%, and on galvanized by 1½ points, with supplementary discount of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+12
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 2
3 in.	40	2 to 2¼ in.	— 3
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	48
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	48
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

cans, but just now the principal demand is for general line can sizes. This demand is exceptionally good.

Cold-Finished Steel Bars and Shafting.—Specifications are lighter than they have been with most makers in this district. The fact that prices have stopped advancing encourages buyers to defer purchases against future needs.

Bars, Plates and Shapes.—Makers in this district note no marked variation in the rate of incoming tonnage releases. If there has been any definite change, it has been slightly upward because of the increase that comes in the final week of each month in preparation for the following month's requirements. The price situation is not entirely satisfactory to the mills, but at the same time steel manufacturers have retained enough of the advances made the past few months to have slightly lifted their average prices. Some consumers of hot-rolled bars appear to have accumulated fair-sized stocks, more especially those having warehousing facilities. Structural steel lettings in this area still are moderate and only the larger shops seem to have good order books.

Hot-Rolled Flats.—The effect of a good demand is tempered by irregularity in prices. While cooperage stock is holding well at 2.20c., base, the more common price on narrow material up to 3 in. wide, is 2.10c. and on 3-in. to 6-in. widths 2.10c. is somewhat exceptional, with an increasing number of sales going at 2c. On very wide strips, makers are obliged to recognize plate prices, which are not over 1.85c. base, on worth-while tonnages.

Cold-Rolled Strips.—Makers still note a good flow of specifications on old business, carrying prices $3 a ton under present regular quotations, but in going after second quarter business at the advance considerable resistance is uncovered. The large tonnage buyers have been given additional protection at the lower prices and so far as large lots go, the test of the present base of 3.15c. for lots of 1 to 3 tons is still to come.

Bolts, Nuts and Rivets.—Manufacturers who produce only rivets are quoting large sizes at $2.75, base, per 100 lb., Pittsburgh or Cleveland, and $3, base, Chicago and Birmingham, and small sizes at 70 per cent off list and report sales at these prices. These prices are not, however, the bottom of the market if sales by bolt and nut makers with rivet-making capacity are to be recognized. Few of the latter can supply the full range of sizes of rivets and some are said to be accepting rivet business at concessions in order to get bolt and nut orders at the full prices. Demand for bolts and nuts is good, but does not heavily tax productive capacity.

Coke and Coal.—There is little of interest in the coke market, which still is dull and easy under excessive supplies in relation to wants. The coal market, however, is showing a fair degree of activity. A Cleveland steel company late last week closed for 450,000 tons of coking coal, which will be shipped from the Fairmont, W. Va., district over the year beginning April 1. The Central Alloy Steel Corporation is in the market for its annual requirements of coking coal. The market still is slow on contract coal, but is developing some resistance to pressure exerted by buyers, notably on gas coal, which seems to have hit bottom at $2.15 per net ton at mines for lump grade.

Old Material.—A number of consumers are now demanding deliveries against orders for heavy melting steel and something of a scramble among dealers to cover their sales is responsible for a decidedly firmer market in that grade. There is a demand from dealers for tonnages for shipment to Johnstown, Monessen, Midland, and Weirton and on ordinary steel the market is not less than $15, while for No. 1 railroad or its equivalent $15.50 would be paid by several dealers and little is to be had. Compressed sheet scrap is still selling at substantially the same price as the ordinary run of heavy melting steel, additional sales being noted of the best lots at $15. The market also is stronger on cast iron borings, which have sold at $11.25 and lately no machine shop turnings have sold under $10.50. The Baltimore & Ohio March scrap list contains 14,820 gross tons. Through an error in transmission, the prices of heavy melting steel last week read $14.50 to $15 and on compressed sheets $14 to $14.25; they should have been $14.50 to $15.50, and $14.50 to $15, respectively.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	$4.39
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	62½ per cent off list
Machine bolts, per 100 count	62½ per cent off list
Carriage bolts, per 100 count	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	$3.00 to 3.10
Wire, galvanized soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$15.00 to $15.50
Scrap rails	14.50 to 15.00
Compressed sheet steel	14.75 to 15.00
Bundled sheets, sides and ends	13.50 to 14.00
Cast iron carwheels	14.50 to 15.00
Sheet bar crops, ordinary	15.00 to 15.50
Heavy breakable cast	13.50
No. 2 railroad wrought	15.00 to 15.50
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	10.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.50 to 17.00
Railroad coil and leaf springs	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Low phosphorus billet and bloom ends	18.50 to 19.00
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	10.50 to 11.00
Short mixed borings and turnings	10.50 to 11.00
Cast iron borings	11.00 to 11.25
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles	18.00 to 19.00
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	17.00 to 17.50
Cupola Grades:	
No. 1 cast	14.50 to 15.00
Rails 3 ft. and under	15.00 to 15.25
Malleable Grades:	
Railroad	15.00 to 15.50
Industrial	14.50 to 15.00
Agricultural	14.00 to 14.50

Two Orders for Sandberg Rails

The Boston Elevated Railway has placed its twelfth order with the Bethlehem Steel Co. for Sandberg sorbitic steel rails—475 tons of 85-lb. ASCE section. From the Chilean State Railways has also come an order for Sandberg rails—200 tons of 100-lb. section, to be rolled and treated by the Bethlehem Steel Co.

The works of the Jones & Laughlin Steel Corporation on the north side of the Monongahela River has completed 60 days' operation without a single disabling accident to any of its employees. Approximately 1,000,000 man-hours have been worked since the last lost-time accident. These plants embrace the by-product coke plant, Eliza Furnace department, Keystone structural fabricating department and the Soho department, which is made up of an open-hearth department, spike factory, chain works and three plate mills.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾ in.	$33.50 to 34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$44.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $45. Cleveland mill base, $44.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.25 to $10.75

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.60 to $2.75
Foundry, f.o.b. Connellsville prompt	3.75 to 4.50
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	11.50
Foundry, by-product, Newark or Jersey City, delivered	9.45 to 9.85
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	0.90 to 1.00
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*
10% $30.00	12%	$34.00
11% 32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*
6% $23.00	10%	$28.00
7% 24.00	11%	30.00
8% 25.00	12%	32.00
9% 26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	92c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$15.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(⅞-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10 to 70
F.o.b. Cleveland	70 and 10 to 70
F.o.b. Chicago	70 and 10 to 70

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Steel Market Steady—Prices Less Certain Than Volume of Business

CHICAGO, March 27.—The Chicago steel market in entering the second quarter is showing a degree of steadiness that had not been expected by many in the trade. Least certain of all factors is that of price, for there are still some sellers who are not strictly adhering to 2c. on bars and narrow plates. The bulk of new sales, however, is being made at the new level. Purchases are heavier than a week ago and fresh inquiry gives promise of a high rate of forward buying. Specifications exceed shipments, making this one of the best seven-day periods since the beginning of the year. Consumers, still intent on holding stocks to a workable minimum, continue to order out steel in accordance with their production schedules. There are no indications that buyers are inclined to speculate in the heavy tonnage products.

Railroad equipment orders include 200 ore cars and 1000 automobile car bodies. Reports are persistent that the Illinois Central is preparing a car-building program, and it is probable that the Chicago & North Western will soon enter the market for about 40 suburban cars. Mild weather in the past few weeks has resulted in early demands for farm machinery that had been placed in stock for spring delivery.

Pig Iron.—Spot buying has assumed the major role in this market as second quarter contracting is practically completed. Indications are that the foundry melt is increasing and several users have already ordered second quarter purchases delivered in April and May. Prices in this market are steady at $18.50, base, though sellers will cut this figure to reach into Michigan. Competition to the south is less keen and producers are holding to natural territories as defined by freight differentials. Furnace output is steady and in smaller volume than shipments, which for March will exceed deliveries in February by at least 10 per cent. Some Southern iron on an all-rail rate is reaching into Michigan. The silvery market is quiet and prices are unchanged.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil.	18.50
High phosphorus	18.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	21.18
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—A small order for ferromanganese has been taken at $100, seaboard. Spiegeleisen is quiet, and buyers are making efforts to place small lots at figures below current quotations.

Prices delivered Chicago: 80 per cent ferromanganese, $107.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $38.76 to $39.76.

Bolts, Nuts and Rivets.—Forward contracting is nearly completed. New prices on stove bolts and large rivets are holding. Specifications are in good volume and producers are engaged close to 70 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Plates.—Interest in the railroad equipment market centers around orders for 200 ore cars by the Chicago, Milwaukee, St. Paul & Pacific and 1000 automobile car bodies by the Chicago & North Western. Steel mills will be called on for close to 15,000 tons of materials for these orders. Fresh inquiries for passenger car equipment bulk large, the New York Central alone having asked for prices on 119 cars. Car shops in the Chicago district are moderately busy, and specifications issued by them from week to week are steady and of decided advantage to mills in arranging rolling schedules. An oil producer in the Southwest is asking for 5000 tons of plates. This inquiry, added to the 5000 tons that came before the trade a week ago, brings total outstanding inquiry for oil storage tanks to not less than 10,000 tons. Car shops, fabricators, tank shops and the general manufacturing trade are all contributing a steady flow of business to local mills. Specifications for plates are about equal to shipments, and new buying is close to the current rate of output.

Mill prices on plates per lb.: 2.00c., base Chicago.

Structural Material.—It is expected that the formal contract for the Palmolive-Peet Building, Chicago, requiring close to 5000 tons of structural steel, will be signed this week. Fresh inquiry of note includes 1800 tons for a building for the Chicago Motor Club. The Rochester Bridge Co. has taken 400 tons for a warehouse for the International Harvester Co., Fort Wayne, Ind. The Buick Division of the General Motors Corporation is planning the erection of a large distributing plant at Clearing, Ill. Fabricating shops in the Chicago district are well engaged, especially since several of the large contracts recently placed are being farmed out to competitive shops by the successful bidders. The general contractor on the approach to the La Salle Street bridge, which will take 900 tons of steel, will fabricate part of the work in his shop and will distribute the remainder of the tonnage to various fabricators. In spite of higher prices for plates, shapes and bars, fabricators have not succeeded in raising the general level of quotations on their work. While several weeks ago some steps along this line were taken, it is evident that not much progress was made, because current quotations are on a level that is not above that which prevailed when shops were eagerly seeking work in order to hold together the skeletons of their organizations. Mill deliveries on shapes range from four to six weeks.

Mill prices on plain material per lb.: 2.00c., base, Chicago.

Bars.—Mild steel bars are the first of the heavy tonnage steel mill products to gain prominence from the viewpoint of an active interest in second quarter contracting. Sales, counting both current business and forward buying, are well ahead of shipments. The motor car industry and accessory manufacturers are largely responsible for this situation. A motor car builder with several plants in Indiana will have produced 27,000 cars at the close of March, an increase of 8000 units over February, and the schedule for April is materially heavier than for this month. Reports from various tractor plants throughout the Central West show that capacity output will not supply the demand, and several manufacturers are talking of expanding plant facilities. Current orders for iron bars are small in total volume. Prices of alloy bars are steady at 2.65c., base, f.o.b. maker's mill. Chicago district mills making alloy bars are engaged at close to capacity. The flow of orders for hard steel bars is steady. New buying and specifications against old orders are well balanced with production. Both Chicago Heights mills continue to operate double turn. Producers are holding to 1.85c., Chicago Heights, for new purchases that are to be delivered in the second quarter. Old contracts at 1.80c. that have not been fully specified will not be cancelled April 1. Deliveries of this commodity range from 10 days to two weeks.

Mill prices per lb.: Soft steel bars, 2.00c. base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.80c. to 1.85c., base, Chicago Heights mill.

Cast Iron Pipe.—Evansville, Ind., will open bids March 29 on 5000 tons of cast iron pipe in sizes ranging from 8 to 24 in., all class B. R. D. Wood & Co. and the American Cast Iron Pipe Co. are low bidders on various classes of centrifugal pipe for Akron, Ohio. James B. Clow & Sons have taken 1000 tons of 4 to 12-in. class B pipe for Barberton, Ohio, and 115 tons of 4 and 6-in. class C pipe for Alliance, Ohio. The National Cast Iron Pipe Co. has been awarded 380 tons of 24-in. class B pipe by Springfield, Ill., and 600 tons of 10-in. pipe at Painesville, Ohio, has been taken by a local contractor. The National company is low bid-

der on 200 tons of fittings for Chicago. Several large contractors' jobs are open for bids in nearby Chicago territory. Prices for 6-in. and larger diameters are steady at $29 to $31, Birmingham.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $36.20 to $39.20; 4-in., $40.20 to $43.20; Class A and gas pipe, $4 extra.

Hot-Rolled Strip.—Specifications for this commodity are heavy and local mills are fully engaged. New sales lack only a narrow margin of being equal to shipments.

Sheets.—Prices in the immediate Chicago territory are holding, but to the south and in the Southwest competition remains keen and quotations are below the levels of the local market. Hot mills are engaged at 80 per cent of capacity and schedules range from 10 days to two weeks. Current buying is of fair proportions, but forward contracting is dull, with the result that the sum of all sales fall short of shipments.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.05c.; No. 24 galvanized, 3.90c.; No. 10 blue annealed, 2.25c. to 2.35c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Rails and Track Supplies.—A Western railroad has ordered 4000 tons of standard-section rails. This tonnage is in addition to the contract placed last winter by that railroad. The inquiry for 4000 tons of rails noted last week is still pending. New business in track fastenings totals 5000 tons, while fresh inquiry is for not less than 16,000 tons. Several carloads of light rails have been ordered. Angle bars are quoted at $2.75 per 100 lb., base, local mills, and tie plates are priced at $2.15 per 100 lb., f.o.b. Chicago.

Reinforcing Bars.—Outstanding among reinforcing bar awards this week is 1000 tons of rail and billet steel bars for a printing plant in Chicago. Fresh inquiry is dull, but old projects are numerous and the trade believes that the bulk of them are active. In the meantime, shop backlogs continue to dwindle more rapidly now than earlier in the month for the reason that open weather is urging contractors to speed work and clear the way for new contracts. This move has resulted in a higher rate of shop activity. Small orders, up to 25 tons, are numerous, and it is on work of this kind that prices are stable. The practice of shading continues on large tonnage quotations. New business and fresh inquiries appear on page 917.

Wire Products.—Shipments of wire products this month are heavier than in any like period in the last four years. As March comes to a close order books are well filled and forward contracting is expanding. Producers, having cut stocks lower than in the midwinter months, are not allowing them to accumulate now because of a slackening in shipments which usually comes in May. Shipments of woven wire fencing are smaller as farmers busy themselves in the fields. The nail market is dull and irregular. Jobbers, having stocks that are out of balance with demand, are showing some anxiety over the situation and resale lots are being offered. To make matters worse, the bulk of these nails were ordered at prices that were below present quotations, and in some instances even at preferential prices. Mills are stubbornly resisting changes in prices, although the matter is somewhat out of their hands at this time.

Coke.—By-product foundry coke is steady at $9, local ovens, and $9.50, delivered in the Chicago switching district. Shipments are moving forward rapidly.

Old Material.—Prices of a number of grades have followed the downward lead taken by heavy melting steel a week ago. Close to 1000 tons of rerolling rails have been purchased by a user at $14.25 a gross ton, delivered, this being a drop of 75c. from the last reported sale. Further weakness is noted in heavy melting steel. A few weeks ago mills became anxious concerning the size of stocks on hand. Purchases were made rather freely and shipments moved forward rapidly in a market that was well supplied with this grade. Since that time stocks in the hands of consumers have grown and buyers, feeling that the emergency is past, are tightening up on inspections and are turning deaf ears to sellers. Melters have refused offers at $13, while on the other hand the close inspection by mills is forcing dealers to pay top prices for a large part of current shipments against old orders. Brokers' trading prices for heavy melting steel range from $12.50 to $13 a gross ton. At Gary shipments are being held back. Strength that had been expected by some in the market for borings has not developed beyond a spurt a week ago. This market is weakened by shipments from producing centers to the east of Chicago. Taken as a whole, this market lacks stability and it is openly declared by some that even lower prices may be expected. Railroad shipments are moving more freely with the present open weather. Yard dealers are not inclined to speculate and in most instances are shipping scrap as fast as it is prepared. Brokers appear to be anxious to speed coverage on old contracts. A producer is offering 1000 tons of borings, and the St. Paul Railroad will sell 6000 tons.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.25c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	3.00
Cement coated nails, base per keg	2.90

Prices delivered consumers' yards, Chicago:

	Per Gross Ton
Basic Open-Hearth Grades:	
Heavy melting steel	$12.50 to $13.00
Shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart, and miscellaneous rails	13.50 to 14.00
Hydraulic compressed sheets	11.00 to 11.50
Drop forge flashings	9.75 to 10.25
Forged, cast and rolled steel carwheels	15.00 to 15.50
Railroad tires, charging box size	16.00 to 16.50
Railroad leaf springs, cut apart	16.00 to 16.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.75 to 14.25
Coil springs	16.25 to 16.75
Electric Furnace Grades:	
Axle turnings	13.00 to 13.50
Low phosphorus punchings	14.25 to 14.75
Low phosphorus plate, 12 in. and under	13.75 to 14.25
Blast Furnace Grades:	
Axle turnings	10.00 to 10.50
Cast iron borings	9.50 to 10.00
Short shoveling turnings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	13.75 to 14.25
Cupola Grades:	
Steel rails less than 3 ft	15.00 to 15.50
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Railroad	12.50 to 13.00
Agricultural	12.00 to 12.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
	Per Net Ton
Rolling Mill Grades:	
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	21.50 to 22.00
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.25 to 9.75
No. 2 busheling	5.25 to 5.75
Locomotive tires, smooth	12.50 to 13.00
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	12.50 to 13.00
No. 1 agricultural cast	12.50 to 13.00
Stove plate	11.25 to 11.75
Grate bars	11.25 to 11.75
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Philadelphia

Steel Market Inactive but Prices Are Firm—Pig Iron Dull

PHILADELPHIA, March 26.—Transactions in plates, shapes and bars are almost completely confined to shipments against current contracts. Specifications for plates are reported to be coming out quite freely, but there is a lag in bars and shapes, consumers evidently having sufficient tonnage on hand for nearby requirements. Mills are maintaining 1.90c., Pittsburgh, on bars, 2.05c., Coatesville, on plates and 2.05c., Bethlehem, on shapes when quoting on new business, but these prices have been subjected to very little test as most consumers are receiving shipments on first quarter contracts at $2 a ton less and have made second quarter purchases at $1 a ton less.

Contracts for bridge construction continue to feature the structural steel market. One fabricator estimates that about 75 per cent of the business on his books is for small and medium-size bridges. Railroads are prominent in this field, but there is also some public work. Bids will be opened April 2 on the Tacony-Palmyra bridge, which will require 8000 tons of structural steel. Some plate business is in prospect from the recent award by the Reading Railroad of six car floats to Delaware River shipyards and the inquiry of the Pennsylvania Railroad for 10 hulls.

Pig Iron.—There is less activity in foundry pig iron than for some time, but the foundry grade is firm at $20, base furnace. Not only are consumers inclined to await price developments, but the smaller foundries are reported to be melting less iron than earlier in the quarter and at the present rate of consumption have sufficient iron due on their present contracts to carry them well into the next quarter. The larger foundry consumers, however, are taking full deliveries on contracts and are operating at a good rate. Low phosphorus is quiet, but prices are firm.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26
East. Pa. No. 1X	21.76
Basic (delivered eastern Pa.)	$19.50 to 20.00
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	24.54 to 25.04
Virginia No. 2X, 2.25 to 2.75 sil.	25.04 to 25.54

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Billets.—Quotations are unchanged at $33 per ton, Pittsburgh, for rerolling billets and $38, Pittsburgh, for forging quality. Current business is confined to small lots for early delivery.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, $\frac{3}{16}$-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.35c.
Cold-finished steel, squares and flats	3.85c.
Steel hoops	3.60c.
Steel bands, No. 12 gage to $\frac{3}{16}$-in., inclusive	3.35c.
Spring steel	5.00c.
Black sheets (No. 24)	4.25c.
Galvanized sheets (No. 24)	5.10c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
¼-in.	5.30c.
$\frac{3}{16}$-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

Bars.—Specifications are coming in rather slowly, but prices are being maintained firmly at 1.85c., Pittsburgh, for second quarter contracts and 1.90c., Pittsburgh, for current delivery. Some desirable tonnages of reinforcing bars are included in pending projects, such as the Allentown, Pa., bridge with 1000 tons, Alden Park Manor apartments, Philadelphia, 800 tons, and marine barracks at Quantico, Va., 600 tons.

Shapes.—Little new business is being booked, but there are some substantial bridge projects in prospect, including the Tacony-Palmyra bridge, requiring 8000 tons of structural steel, and a projected bridge for the Pennsylvania Railroad over the Schuylkill River. Specifications on contracts are coming in slowly and at a rate that in some cases does not require completion of present commitments by the end of the month. Contracts for the coming quarter are at 2c., Bethlehem, or 2.13c., delivered Philadelphia, and the current price on new business is 2.18c., Philadelphia. One eastern Pennsylvania mill continues to meet the contract price on current orders.

Plates.—Consumers are fairly well covered for the next quarter at 2c., Coatesville, or 2.10c., delivered Philadelphia, and on new business at 2.05c., Coatesville, or 2.15c., Philadelphia, is quoted. Specifications are coming out freely from most consumers. Some plate tonnage is in prospect from the award by the Reading Railroad of four car floats to the Sun Shipbuilding & Drydock Co., Chester, and two to the American Brown Boveri Electric Corporation, Camden, N. J. The Pennsylvania Railroad has revived an inquiry for 10 hulls, including car floats, barges and a tug boat hull.

Sheets.—Demand is moderate. There has been some contracting for small second quarter tonnages. Blue annealed sheets are quoted at 2.10c., Pittsburgh, black at 2.90c., Pittsburgh, and galvanized at 3.75c., Pittsburgh. Concessions are rare.

Warehouse Business.—Purchasing from stock is not as large as usual at this season, but prices are being maintained with only occasional reports of concessions, and quantity differentials are adhered to firmly.

Imports.—In the week ended March 24, pig iron receipts at this port totaled 3103 gross tons, of which 303 tons was Dutch and 2800 tons British iron. A total of 4000 tons of chrome ore arrived from Portuguese Africa. Steel imports consisted of 30 tons of bands, 22 tons of steel bars and 180 tons of structural shapes from France, 56 tons of shapes from Belgium and 54 tons of shapes from Germany.

Old Material.—Prices are substantially unchanged. A sizable tonnage of heavy breakable cast has been purchased by an eastern Pennsylvania mill at $16 per ton, delivered. Consumers at Harrisburg, Conshohocken, Pa., and Claymont, Del., are reported to have temporarily held up deliveries of steel on their contracts.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	14.50 to 15.00
Bundled sheets (for steel works)	10.50 to 11.00
Machine shop turnings (for steel works)	10.50 to 11.00
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	11.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.00 to 12.50
Stove plate (for steel works)	12.00 to 12.50
No. 1 low phos., heavy, 0.04 per cent and under	17.50 to 18.00
Couplers and knuckles	16.00 to 16.50
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.50 to 11.00
Machine shop turnings (for rolling mill)	11.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Steel rails for rolling	15.00 to 15.50
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	14.50 to 15.00

Cleveland

March Steel Business About Equals February's—Weakness in Sheets

CLEVELAND, March 27.—The volume of business in steel bars, plates and structural material fell off somewhat the past week, the market not bearing out expectations that there would be a rush of specifications against 1.80c. contracts expiring March 31. However, March business will about equal that of February. Mills generally have advised their trade that unspecified tonnage will be cancelled. Some buyers are taking out all steel covered by their contracts and others whose plants are not very busy will allow cancellations. Much of the steel shipped during the first half of April will be against the old 1.80c. contracts. On steel bars, plates and structural shapes the price range remains at 1.85c. to 1.90c., Pittsburgh, the lower price being for contracts or fair-sized lots, as most buyers are now under contract at the lower price. New demand is confined largely to small lots that are bringing 1.90c. Local mills quote the same prices f.o.b. Cleveland. To meet the Cleveland competition, an Ohio mill is quoting forging steel bars at 1.90c., base, mill, equivalent to 1.80c., Pittsburgh, for Cleveland delivery. The demand for steel from the automotive industry continues heavy, but motor car builders as a rule are ordering only far enough ahead to assure a steady flow of material from the mills as needed. This business is keeping the mills well filled and recent operations are being maintained. The automotive industry evidently will keep up its present production through April and good operations are predicted at least through May. While metalworking plants in some lines outside of the automotive industry are somewhat busier than recently, others show little if any improvement. Inquiry in the building field is slow.

Pig Iron.—The market was not as active the past week as in preceding weeks, sales by Cleveland interests having declined to 16,000 tons. Some of the business came from foundries that had previously covered for only part of their second quarter requirements. Inquiry is not very plentiful, although one Lake furnace has inquiries for several lots aggregating 8000 tons. While a few third quarter inquiries have come out, producers so far have refused to quote for that delivery. First quarter business with some foundries has been considerably below expectations and, as a result, several of the furnaces will carry considerable first quarter iron over to the second quarter. Several of the automobile foundries have issued April specifications and will take as much iron during the next month as in March. Central Western foundries in the radiator, stove and heater fields are reported to be operating at about normal capacity. Agricultural implement foundries are operating better than recently. Business with many of the jobbing foundries is still slack. There is little interest in the price situation, as producers are not attempting to get higher prices and on the other hand are not showing a disposition to shade ruling quotations. Cleveland furnaces are adhering to $17, furnace, for foundry and malleable iron except on business for shipment to highly competitive points, for which they are going to $16.75. One Lake furnace interest is on a $17.50 minimum basis. In Michigan the market is firm at $18.50.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	$26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Coke.—A $1 a ton price reduction on egg coke for domestic use to $6, ovens, has been made in the Detroit territory. Ohio producers are still adhering to $4.50, which is meeting with resistance from dealers who want a lower summer price. Foundry coke sales are limited to small lots with prices unchanged. Ohio by-product foundry coke is quoted at $8, Painesville, or $9.01, delivered Cleveland, for April shipment.

Iron Ore.—Producers have not yet submitted quotations on the inquiry of the Ford Motor Co., which may establish the market for the season. Consumers seem to be in no hurry to have prices named. The volume of open market buying, which has become greatly reduced the past few years because of long-term contracts, is expected to be about the same this year as during 1927. There is a disposition among vessel men to delay the starting of boats until May 1, even should navigation open sooner, in order that they be assured of better operations later in the season. However, if consumers are in need of ore they will be able to secure April shipments, provided ice conditions permit the operation of boats.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts are fair and March business will show a gain over February. Many buyers are placing second quarter contracts. Rivet makers report that they are not meeting much resistance to the $3 a ton price advance for the second quarter and have closed considerable business at the new price of $2.90 per 100 lb., Cleveland and Pittsburgh, large rivets. However, specifications against present $2.75 contracts are only moderate.

Sheets.—Weakness in black sheets reported a week ago became more pronounced the past week. Some of the producers have abandoned, at least temporarily, a Pittsburgh base and quotations of 2.85c. to 2.90c., Valley mill, have become rather common and prices as low as 2.70c., mill, are reported. Galvanized sheets also show further weakness, being quoted at 3.65c. and lower at Ohio mill. Some of the mills have agreed to accept specifications on old low-priced contracts up to April 1, and this is evidently one reason for the weakness, another being the need by some of the mills for tonnage. Although occasional concessions to 4c. are reported on auto body sheets, these generally are holding firm and considerable business is coming from the Michigan territory at the regular 4.15c. price. Blue annealed sheets are firm. Demand is slow outside of the automotive industry, and few buyers are placing second quarter contracts.

Wire Products.—Weakness has appeared on wire nails in some sections, where a price of $2.55 per 100 lb. keg, Ironton, is reported. Jobbers who have large low-priced stocks have also been a disturbing factor. However, mills appear to be holding to the regular price in this territory. The demand is not active.

Strip Steel.—Strip steel mills are accepting specifications against old low-priced contracts for hot-rolled strip up to April 1 and these are coming out in good volume. While some second quarter contracts have been placed at present prices, these prices have not yet been tested by large-lot buyers. A 3c. base price, or a $3 a ton reduction, has appeared on cold-rolled strip, but leading producers appear to be holding to the regular price. However, there has not been much test of the market, as most orders are against old contracts.

Semi-Finished Steel.—A local producer has taken additional reservations for sheet bars, billets and slabs for the second quarter without naming prices. Some wire rod contracts have been placed at the regular $44 Cleveland price.

Alloy Steel.—Some second quarter contracts have been placed at the new prices. Mills generally are ask-

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.60c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

ing a quantity differential of $2 a ton or 2.75c., base, for less than car lots and up to 2.85c., base, for very small lots.

Reinforcing Bars.—The only large award is for 1000 tons for store buildings in Cleveland. New inquiry is confined to small lots. Rail steel bars are commonly quoted at 1.75c., mill.

Warehouse Business.—Jobbers are getting a good volume of orders, but they are for small lots. The total volume of business shows a slight gain. Regular prices are well maintained.

Old Material.—A Cleveland mill purchased a small tonnage of scrap during the week, paying $14 for No. 1 heavy melting steel and $11.25 for short shoveling turnings. No new demand is coming from other northern Ohio or Valley district mills. Shipments are still closely restricted, although one Cleveland mill is taking scrap somewhat more freely than recently. While the market has a weak tone, quotations are unchanged. Dealers are able to buy car lots for quick movement at slightly below quoted prices. Several automobile makers in the Michigan territory have issued their scrap lists for April. These include: Buick, 4000 tons; Chevrolet, 25,000 tons; Cadillac, 400 tons. The Muncie Products Co. is offering 500 tons.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.75 to $14.00
No. 2 heavy melting steel	13.25 to 13.50
Compressed sheet steel	12.75 to 13.00
Light bundled sheet stampings	11.50 to 11.75
Drop forge flashings	12.50 to 13.00
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	11.00 to 11.25
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.00 to 10.25
Mixed borings and short turnings	10.00 to 10.25
No. 2 busheling	10.00 to 10.25
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

New York

Keener Competition in Pig Iron—March Steel Tonnage High

NEW YORK, March 27.—The volume of pig iron sales is holding up rather well, but increasingly keen competition among furnaces is having an adverse effect on prices. Unusually favorable barge rates from Buffalo have resulted in lower delivered prices on foundry iron at many points in this territory, but even for all-rail shipment base prices at Buffalo are somewhat weaker, ranging from $16 to $16.50. Furnaces east of Buffalo are meeting this competition in some instances, but eastern Pennsylvania furnaces, which are still quoting $20, base, are taking little business in this district. No longer expecting advances in prices, melters have resumed a policy of short-term buying and are showing little interest in requirements beyond second quarter. Purchases for the past week, which were to a large extent for nearby shipment, covered a total of 9000 tons, a gain of 2000 tons over the previous week. The Foran Foundry & Mfg. Co., Flemington, N. J., has closed for 500 tons of No. 2 plain and 400 tons of No. 2X for second quarter and is understood to have obtained a lower delivered price than was quoted by eastern Pennsylvania furnaces. The General Electric Co. has bought 500 tons for its Erie, Pa., plant, but still has 2000 tons to buy for various other foundries. The Singer Mfg. Co., Elizabeth, N. J., is inquiring for a substantial tonnage for Elizabeth and for its Canadian plant. The Abendroth & Root Mfg. Co., Newburgh, N. Y., is also in the market for a tonnage for second quarter delivery. In general, melt is holding its own and in some directions is expanding.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	20.89 to 23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 23.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Finished Steel.—A few makers of cold-rolled strip steel have formally announced a reduction of $3 a ton for second quarter, going back to the prices at which most of the first quarter contracts were made, namely 3c., Pittsburgh or Cleveland, for lots of 1 to 3 tons and 2.75c. for lots of more than 3 tons. Some second quarter contracts have been made at 2.90c. for lots of more

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-rolled strip, soft and quarter hard,	5.15c. to 5.40c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage),	3.84c. to 3.89c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in	$17.33
Seamless steel, 2-in	20.24
Charcoal iron, 2-in	25.00
Charcoal iron, 4-in	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c. to 4.00c.
No. 22	3.95c. to 4.15c.
No. 24	4.00c. to 4.20c.
No. 26	4.10c. to 4.30c.
No. 28*	4.25c. to 4.45c.
No. 30	4.50c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.35c. to 4.60c.
No. 20	4.50c. to 4.75c.
No. 22	4.55c. to 4.80c.
No. 24	4.70c. to 4.95c.
No. 26	4.95c. to 5.20c.
No. 28*	5.20c. to 5.45c.
No. 30	5.60c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

than 3 tons. On other products prices are fairly steady, although the market on galvanized sheets in New York is somewhat upset by sales from jobbers' stocks at 3.65c., Pittsburgh, when mills are trying to obtain 3.75c. on second quarter contracts. Contracting for sheets for second quarter has not been large, but mills are adhering quite firmly to published quotations. In plates, shapes and bars the bulk of second quarter contracting has been done at 1.85c., Pittsburgh, for bars, 2c., Coatesville, for plates and 2c., Bethlehem, for shapes, but quotations $1 higher are applying on small-lot orders. Some weakness has developed in hot-rolled strip, but mainly in the wide sizes that meet plate mill competition. Concessions of $1 a ton have been granted in such instances. Demand for steel products, represented chiefly by specifications against contracts, has held at a high rate during March, and the total scheduled for shipment by sales offices is running larger than in the same number of days in February. Merchant pipe is moving more freely out of jobbers' stocks and this is reflected in a slightly better operating rate at the mills. A heavy volume of specifications for plates, shapes, bars, sheets and strip steel is expected this week, some mills insisting on complete first quarter specifications by March 31, with unspecified portions to be cancelled. These specifications will provide many consumers with enough steel for April, and as a result second quarter prices will not take real effect for some little time. Considerable building work is in prospect in New York, but meanwhile competition among fabricators is so keen that prices of fabricated material do not increase. The largest structural steel inquiry is for 8000 tons for unit No. 9 in the Tudor City development, New York.

Mill prices per lb., delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.17½c. to 2.22½c.; structural shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

Warehouse Business.—There is a fair volume of purchasing and prices are quite firm, except for occasional shading on structural material when competition from foreign steel is encountered. Sheet prices are fairly firm at 4c. to 4.20c. per lb., base, for black and 4.70c. to 4.95c. per lb. for galvanized. Mill prices on zinc sheets have been reduced 1c. per lb. to 8.50c. per lb., base, but no corresponding reduction has been made as yet by jobbers.

Cast Iron Pipe.—Private purchases of bell and spigot pipe are principally of small tonnages, but the number of such purchases is increasing. Prices show greater firmness and, although delivered prices of Northern makers are still slightly under the delivered quotations of Birmingham foundries, the tendency evidently is upward. There are some small tonnages in the market for export, but the foreign purchasers are slow to close.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $37.25 to $38.25; 4-in. and 5-in., $42.25 to $43.25; 3-in., $52.25 to $53.25; Class A and gas pipe, $4 to $5 extra.

Reinforcing Bars.—A highway bridge across the Raritan River at New Brunswick, N. J., on which bids will be opened April 9, will require 1700 tons of bars. No other new projects of large size have been reported in the last week, but some distributers report an increase in the number of small jobs for which bars will soon be bought. The mill price ranges from 1.95c. to 2c., Pittsburgh, with the majority of business being placed at the latter figure. Distributers are quoting 2.20c., Youngstown warehouse, or 2.57½c. on cars at New York, and out of New York warehouse the general quotations are 2.80c. for lots of 5 tons or more, 2.95c. for lots of 2 to 5 tons and 3.24c. for less than 2 tons, all delivered at job.

Coke.—The market continues quiet and prices are unchanged. Standard furnace is quoted at $2.75 to $3 per ton, Connellsville. Delivered prices in this district of special brands of beehive foundry coke are: To northern New Jersey, Jersey City and Newark, $8.71 to $8.81 per net ton; to New York and Brooklyn, $9.59 to $9.69 per net ton. By-product coke is quoted at $9 to $9.40 per ton, Newark or Jersey City, and $10.06 to $10.29 per ton, New York or Brooklyn.

Old Material.—Prices still show a slight downward tendency on some grades, with the market quiet. No. 1 heavy melting steel is being shipped to consumers at Coatesville and Bethlehem, Pa., and yard grade to Pottsville and Phoenixville, Pa. Users at Claymont, Del., and Conshohocken, Pa., have temporarily suspended shipments on their contracts and a Harrisburg consumer of steel is taking only a few carloads. Brokers are offering $15.50 per ton, delivered Coatesville, for heavy breakable cast.

Dealers' buying prices per gross ton f.o.b. New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	7.00 to 7.25
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	8.50 to 9.00
Locomotive grate bars	8.75 to 9.00
Machine shop turnings	6.75 to 7.50
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	6.75 to 7.50
Mixed borings and turnings	7.00 to 7.50
Steel car axles	15.50 to 16.00
Iron car axles	23.75 to 24.75
Iron and steel pipe (1 in. dia., not under 2 ft. long)	8.25
Forge fire	6.75 to 7.00
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought, long	8.50 to 9.00
Rails for rolling	10.50 to 11.00
Cast iron carwheels	10.75 to 11.25
Stove plate (foundry)	8.50 to 9.00
Malleable cast (railroad)	10.00
Cast borings (chemical)	11.00 to 11.50

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$13.75 to $14.25
No. 1 heavy cast (columns, building materials, etc.), cupola size	11.75 to 12.25
No. 2 cast (radiators, cast boilers, etc.)	11.25 to 11.75

RAILROAD EQUIPMENT

Atlantic Coast Line has made inquiry for 200 70-ton phosphate cars.

Manganiferous Iron Co., Ironton, Minn., has purchased four 20-cu. yd. air dump cars from Koppel Industrial Car & Equipment Co.

Cudahy Packing Co. will buy 100 steel underframes for refrigerator cars.

Pacific Fruit Express contemplates purchasing 400 to 800 steel underframes for refrigerator cars.

Chicago & North Western has ordered 500 automobile car bodies from Standard Steel Car Co. and 500 from General American Car Co.

Southern Pacific has made inquiry for 10 air-dump cars.

Chicago, South Shore & South Bend is inquiring for 10 interurban coaches.

St. Louis-San Francisco has ordered five gas-electric rail motor mail and baggage cars.

Amtorg Trading Corporation, 165 Broadway, New York, is inquiring for 15 20-ton flat cars.

Pere Marquette will make inquiry for 20 steel air-dump cars of 30 cu. yd. capacity.

Chicago, Aurora & Elgin will buy 10 interurban coaches.

New York Central has issued inquiry for 119 passenger train cars for service on its various lines as follows: 19 passenger coaches, 10 motor car bodies, three passenger and baggage and two baggage and mail coaches, 30 baggage cars, 19 horse cars, 30 milk cars and six dining cars.

Chicago, Milwaukee, St. Paul & Pacific has ordered 200 ore cars from Pressed Steel Car Co. This railroad will also buy 10 baggage cars.

February Production of Malleable Castings Best in 10 Months

WASHINGTON, March 24.—Production of malleable castings in February totaled 59,045 tons against 54,818 tons in January, shipments were 53,407 tons and 47,691 tons respectively, and orders booked, 55,452 tons and 53,153 tons respectively, according to reports received by the Department of Commerce from 133 identical plants, five of which, with an aggregate monthly capacity of 4700 tons, were idle in February. The percentage of operation in February was 63.8, against 59.6 in January.

Compared with a year ago, production showed a gain of 3 per cent in February, but shipments fell off 2 per cent and orders booked dropped 4½ per cent. Production last month was the best for any month since last April. There has been a steady gain since a low point of 40,845 tons was reached in November.

Canada

General Business Trend Is Upward—Weakness in Pig Iron at Montreal

TORONTO, ONT., March 27.—The general trend of business in the iron and steel industry of Canada shows more evidence of strength than it has for several years past. Steel mills, foundries, railroad equipment builders, automobile plants, agricultural implement makers, radiator manufacturers and various other units of the metal working field all report some improvement. Steel mills are behind in filling orders, with the result that plants are running from 18 to 24 hr. a day.

The Canadian National Railways placed orders during the week for rolling stock equipment to the value of $3,250,000. The orders were distributed among the National Steel Car Corporation, the Canadian Car & Foundry Co., Ltd., and the Eastern Car Co.

Included in the work to be undertaken this year by the Canadian Pacific Railway on its Eastern lines will be the replacement of five large steel bridges on the Oshawa subdivision east of Toronto, with heavier spans so that the largest engines may be operated between Montreal and Toronto. The new Canadian Pacific Railway rail allotments for 1928 includes 150 miles of 100 lb. rails, of which 68 miles will be laid on the Nipigon subdivision in continuation of a plan to equip the main line from Toronto to Fort William with heavier steel, and 50 miles will be laid between Toronto and London, Ont.

Pig Iron.—Improvement in business continues. Sales on spot account are steadily increasing both in number and tonnage, and indications are that second quarter business will show improvement of from 10 to 15 per cent over that of the first quarter. Advance contract placing has been active during the past couple of weeks. Competition from United States sources of supply is causing increasing concern to Canadian producers. In the Niagara Peninsula, Buffalo interests have gained a rather strong footing in addition to the big business they have developed in this country from the agricultural implement industry. Blast furnace representatives in the Montreal market also have strong competition with which to contend, especially from the Port Henry, N. Y., producer. This competition has had a tendency to shut out foundry iron from Hamilton and Sault Ste. Marie, Ont., which iron quoted at the Toronto base with freight added brings it much higher than the prices quoted by American rivals. Sydney, N. S., is the most likely Canadian source of supply for the Montreal market, but prevailing Canadian prices are also against Sydney furnaces. Strong competition at Montreal has been reflected in a softening of prices, and it is understood that sales have been made at approximately $1 per ton below former quotations. Production of coke pig iron in Canada at 64,691 gross tons in February showed little change from the 65,006 tons in January, but was 28 per cent above the 50,695 tons produced in February last year.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	$24.50 to $25.00
No. 2 foundry, sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	24.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—Sales for the week again showed improvement over those of former weeks this year and inquiries indicate that the stronger demand may continue for some time. In addition to the improvement in spot demand, advance buying has become more general, with a number of consumers placing forward delivery contracts. Some big contracts have been placed for second quarter delivery, and others are pending. Taken as a whole, the Canadian scrap market has been slowly but steadily making progress since the first of the year, and despite the fact that prices remain unchanged they are stronger than formerly and much of the shading has disappeared.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

St. Louis

Steel Operations at a High Rate—Spurt in Pig Iron Buying

ST. LOUIS, March 27.—Pig iron sales took a spurt during the last week. The St. Louis Gas & Coke Corporation sold 9000 tons of all grades, including 5000 tons of basic to an East Side melter; 2500 tons of malleable to a nearby melter for second quarter shipment and the remainder in foundry grades in lots from a carload up to 300 tons. A leading Southern maker sold 500 tons in lots of about 100 tons. The principal inquiry is for 1000 tons of Northern iron for an Evansville, Ind., melter, and a consumer of Southern iron wants 400 tons. Prices are unchanged, and business is being taken for second quarter on the basis prevailing now.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	20.66
Southern No. 2 fdy., delivered	20.42
Northern malleable, delivered	20.66
Northern basic, delivered	20.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Iron and Steel.—The Granite City Steel Co. reports that it has sufficient business booked to operate its plate mill at capacity for several weeks, that its tin plate department promises to run full for some time, that blue annealed sheet demand is high for this time of year and its jobbing mill is operating full time, and that its open-hearth department is operating at about 90 per cent. Black sheets are in good demand, but orders for galvanized sheets are showing some falling off. Warehouse business continues quiet.

Coke.—Warmer weather has affected adversely the demand for domestic coke. Foundry grades are moving well, but buying continues only for immediate needs.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets (No. 24)	4.50c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	70
Less than 100 lb	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more	60
Less than 200 lb	50

Old Material.—The market for old material continues weak. Heavy melting steel, heavy shoveling steel, railroad springs and No. 2 railroad wrought are 25c. a ton lower; miscellaneous rails, steel angle bars and cast iron carwheels are 50c. lower, and rails for rolling are $1 lower. Consumers are liquidating stocks on hand, and it is not likely that they will buy much old material for the next 60 to 90 days. In the meantime, the only activity is among dealers, who are buying to cover contracts. Railroad lists include: New York Central, 6500 tons; Chicago, Burlington & Quincy, 4990 tons; Mobile & Ohio, 1300 tons; Chicago, Milwaukee & St. Paul, 139 carloads; and Nickel Plate, 24 carloads.

Prices per gross ton, f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$11.25 to $11.75
No. 1 locomotive tires	12.25 to 12.75
Heavy shoveling steel	11.25 to 11.75
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.50 to 13.00
Railroad springs	14.00 to 14.50
Bundled sheets	8.75 to 9.25
No. 2 railroad wrought	11.25 to 11.75
No. 1 busheling	9.75 to 10.25
Cast iron borings	9.00 to 9.50
Iron rails	13.00 to 13.50
Rails for rolling	12.75 to 13.25
Machine shop turnings	7.00 to 7.50
Steel car axles	18.50 to 19.00
Iron car axles	23.50 to 24.00
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	10.00 to 10.50
Steel rails, less than 3 ft	15.00 to 15.50
Steel angle bars	11.50 to 12.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	14.00 to 14.50
Railroad malleable	11.00 to 11.50
No. 1 railroad cast	13.50 to 14.00
Stove plate	13.00 to 13.50
Agricultural malleable	12.00 to 12.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Birmingham

Steel Demand Continues on Upgrade —Pig Iron Buying Light

BIRMINGHAM, March 27.—New pig iron tonnage is not large, and buying continues on a hand-to-mouth basis. Most of the new tonnage is in lots of from one to three carloads. A slight movement in forward buying was noted during the past week, but very few consumers have covered for their second quarter requirements. Spot sales are at about the same level as for the past several weeks. Quotations on foundry iron remain on a $16 base. Shipments continue close to production. Eighteen furnaces are in blast, the same as for the past two weeks.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil	$16.00
No. 1 foundry, 2.25 to 2.75 sil	16.50
Basic	15.00

Finished Steel.—Demand is carrying forward the improvement shown in the preceding weeks of March, and the market has a firm tone. Inquiries dropped slightly last week, but still continue to come in at a fair rate. Mill prices are unchanged. Structural steel fabricators report a good increase in new business and an improved outlook. The Connors Steel Co. last week booked several new orders for reinforcing bars, ranging from 35 to 120 tons. The Tennessee Coal, Iron & Railroad Co. continues to operate 13 or 14 of its open-hearths and the Gulf States Steel Co. is still working four of its six.

Cast Iron Pipe.—Pressure pipe manufacturers continue to find a better feeling in the market, and inquiries indicate that a good volume of tonnage is in prospect. New business for the past week has been in small tonnage orders. Plant operations have changed but little in the past several weeks. Prices are firmer, with the base quotations still at $29 to $31.

Coke.—Although several of the larger consumers have covered for their second quarter requirements, considerable tonnage is still being booked for second and third quarter deliveries. Spot sales are holding up well. Quotations for spot, second and third quarter coke remain at $5.

Old Material.—Demand is still light. Regular customers are buying for present requirements only and are showing very little interest in increasing stocks. Prices are unchanged.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$9.50 to $10.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00
Stove plate	14.50
Steel axles	19.00 to 20.00
Iron axles	20.00 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	13.00
No. 1 cast	14.50
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

Pacific Northwest

Inquiry for Steel More Active— Prices Are Holding Firmly

SEATTLE, March 23 (*By Air Mail*).—Local inquiry for steel is more active, and several fairly large jobs in plates and shapes were placed in the past week. Jobbers report more tonnage moving, and March sales are larger than last month's. Prices are holding, but so far there is not much disposition on the part of buyers to anticipate needs. The local building situation is active, and building permits issued in this quarter show a heavy increase over the same period of last year.

Pig Iron.—The local market is very quiet. Small lots of foundry iron from India and Germany continue to come into this market. Utah basic and No. 2 foundry are quoted at $24 to $25, delivered Seattle.

Structural Steel.—The largest contract for the week was for 1500 tons for the Stimson Building, taken by the Wallace Bridge & Structural Steel Co. The city of Seattle has voted bonds for the building of the West Waterway and Stoneway bridges, which are expected to take 5000 tons or more. Bids will not be requested for some time. Two State highway bridges, one at Kettle Falls, the other at Queets River, Wash., together taking about 1600 tons, will come up for bidding in April. Shapes are firm at 2.35c., f.o.b. Seattle.

Plates.—The Steel Pipe & Tank Co., Portland, has booked 700 tons for a water line for Everett, Wash., the material to be furnished by Bethlehem Steel Corporation. The city penstock at Cedar River, 1200 to 1500 tons, will be placed in a few days. General demand for plates is quiet, with not much new work in sight. Plates are firm at 2.30c., c.i.f. Seattle, for tank quality.

Track Supplies.—The city of Seattle is in the market for 200 tons of 80-lb. rails for local street railway work. The order may be placed within the next week.

Reinforcing Bars.—Contracts placed in the week include 200 tons for the Stimson Building, 180 tons for a Seattle fire station and 225 tons for the physics building at the University of Washington. Work in sight calls for about 2200 tons for the Bon Marche Building, 420 tons for the Bolker warehouse and 1000 tons or more for the Peck & Hill warehouse, all in Seattle. Bars are 2.20c. to 3c.

Hoops and Bands.—Demand for hoops is fair, but for bands is very quiet. The current quotation is 2.87c., c.i.f. Seattle.

Cold-Finished Steel Bars and Shafting.—Local demand is reported somewhat better, but is only for small lots for early needs. The local quotation is 3.20c.

Sheets.—The market is fairly active for galvanized, but for black and blue annealed sheets is very quiet. A local maker of hot water heaters recently imported

Warehouse Prices, f.o.b. Seattle

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Tees, bar sizes	3.25c.
Reinforcing bars	3.00c.
Blue annealed sheets (No. 10)	4.00c.
Black sheets (No. 24)	5.00c.
Galvanized sheets (No. 24)	5.75c.
Structural rivets, ½-in. and larger	5.50c.

about 200 tons of black sheets from Germany. Local quotations are: No. 24 black, 3.60c.; No. 24 galvanized, 4.35c., and No. 10 blue annealed, 2.75c.

Warehouse Business.—Jobbers report that orders and deliveries of steel products in March will show some increase over last month, customers showing also more inclination to buy in larger lots. Prices are firmer. A new price list just issued by a leading jobber shows several advances.

San Francisco

Reinforcing Steel Awards Total 5000 Tons—3000 Tons of Shapes for Bridge

SAN FRANCISCO, March 27. (*By Telegraph*).—Trading continues well sustained for this season of year, the reinforcing steel bar market being the most active. Awards totaled over 5000 tons, a San Francisco jobber taking 1950 tons for Pier 48. Gunn, Carl & Co. secured 1000 tons for Ocean Beach Esplanade, San Francisco, and Pacific Coast Steel Co. booked 750 tons for Veterans' Hospital at Portland, Ore. Pending business is now in excess of 13,000 tons.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Plates.—Only two plate awards are reported. The Steel Tank & Pipe Co. booked 240 tons for a pipe line at Everett, Wash., and a Seattle interest secured 175 tons for repair of the steamer Iroquois. Interest is still centered in the inquiry for the Wildcat and Sequoia aqueducts in Oakland requiring 8400 tons.

Structural Shapes.—The largest structural award of the week called for 3000 tons for the Coyote Point bridge across San Francisco Bay, booked by the Virginia Bridge & Iron Co. Pending business totals over 14,000 tons. Bids have been received on 4000 tons for Capwell's Store in Oakland. Fabricators in the San Francisco district have agreed not to purchase any more foreign shapes and more stabilized fabricated and erected prices are now expected.

Cast Iron Pipe.—The only cast iron pipe award was secured by the United States Cast Iron Pipe & Foundry Co. and involved 712 tons of 6 to 20-in. classes B and C pipe for Santa Barbara, Cal. This company was low bidder on 500 tons of 10 to 24-in. class B pipe for Santa Ana, Cal. Bids have been taken on 170 tons of 4 to 8-in. class B for Aberdeen, Wash., and on 132 tons of 4 and 6-in. class B for Oak Harbor, Wash. Bids will be opened next week on 553 tons of 6 to 12-in. class C for San Bernardino, Cal., also 181 tons of 6 and 8-in. class B for the improvement of Foothill Boulevard, Azusa, Cal., and on 114 tons of 6 to 10-in. class B for Red Bluff, Cal. Buckeye, Ariz., will open bids on April 16 for 234 tons of 4 to 8-in. class B, and Riverside, Cal., will take bids on April 3 for 127 tons of 6-in. class B for improvement of Washington Street. The Grinnell Co. took 360 tons of 8-in. seamless pipe for Los Angeles and will supply foreign material. Bids have gone in on 510 tons of 4 and 6-in. seamless pipe for Brighouse, B. C., and the Armona Public Utility District, California, will open bids on April 3 for 125 tons of 2 to 8-in. O. D. pipe.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, $\frac{3}{16}$-in. and over	3.15c.
Small angles, under $\frac{3}{16}$-in.	3.55c.
Small channels and tees, $\frac{3}{4}$-in. to 2$\frac{3}{4}$-in.	3.75c.
Spring steel, $\frac{1}{4}$-in. and thicker	5.00c.
Black sheets (No. 24)	4.95c.
Blue annealed sheets (No. 10)	3.90c.
Galvanized sheets (No. 24)	5.50c.
Structural rivets, $\frac{1}{2}$-in. and larger	5.65c.
Common wire nails, base per keg	$3.40
Cement coated nails, 100-lb. keg	3.40

Cincinnati

Pig Iron Sales Decline—Slight Weakness in Scrap Market

CINCINNATI, March 27.—Pig iron sales in the past week have been light and indications are that there will be no improvement in the immediate future. The Louisville & Nashville has bought 590 tons of foundry and charcoal iron, a Chattanooga, Tenn., melter 500 tons of malleable, and a Michigan company 500 tons of Jackson County silvery iron. Aside from these transactions, orders have been for lots ranging from single carloads up to 200 tons. The only sizable inquiry before the trade is for 1000 tons of foundry for second quarter delivery to a Hamilton, Ohio, consumer. Prices have not been changed, southern Ohio foundry iron remaining firm at $19, base Ironton; Tennessee and Alabama iron at $16, base Birmingham, and northern Ohio foundry at $16.75 to $17, base furnace.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	19.69
Alabam fdy., sil. 2.25 to 2.75	20.19
Tennessee fdy., sil. 1.75 to 2.25	19.69
Southern Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Demand for steel from consuming industries has been well sustained in the past week, and mills are encouraged by the amount of business they are getting out of this territory. There has been a slow upward movement in the volume of specifications against old contracts at low prices, many users of bars, structural shapes and plates having provided themselves with sufficient tonnage to carry them through a considerable part of the second quarter. Aside from an award of about 800 tons of structural steel for bridges by the Louisville & Nashville Railroad, the structural market has been quiet. Small fabricators continue to be fairly well engaged, but the larger shops are in need of work. The placing of second quarter orders for sheets has been accelerated in the last seven days, and the result is that prices are becoming more firmly established at 2.10c., base Pittsburgh, for blue annealed, 3.75c. for galvanized, 2.90c. for black and 4.15c. for automobile body stock. Sales have been diversified so that mills turning out all kinds of sheets have been enabled to operate on an economical basis. The American Rolling Mill Co. declares that all of its units still are on a production schedule calling for 100 per cent of capacity. There has been a slight decrease in sales of nails, which are quoted at $2.65 per keg, base Ironton or Pittsburgh. Makers of cold-rolled bars and cold-rolled strips report that the volume of orders has been only fair.

Warehouse Business.—Shipments from local warehouses in March were approximately the same as those in February, although several companies reported slight increases. Bars and structural steel are the most active commodities, while sales of common wire nails have been good. Prices are steady and unchanged.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforcing bars	3.15c.
Rail steel reinforcing bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Coke.—While by-product foundry coke specifications have fallen off slightly, shipments in March will be the largest in at least six months. Prospects for April are regarded as good, although the volume of business is not expected to equal that in either February or March. Continuation during the next 30 days of the present price of $7.50 per net ton, f.o.b. ovens, for foundry coke is practically assured, although no formal announcement to that effect has been made. That there will be a sharp cut in domestic grades is conceded by dealers, but the exact amount of the reduction has not yet been determined.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates, $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Further weakness in the scrap market has necessitated a drop of from 25c. to 50c. a ton on railroad wrought, short rails, railroad malleable and agricultural malleable. Meanwhile, heavy melting steel remains unchanged at $11 to $11.50. Steel plant operations in this district are on a basis approaching capacity and therefore shipments of material on current contracts have been fully up to normal. Mills, however, are not anticipating future requirements, preferring to purchase scrap only when they can use it immediately.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$11.00 to $11.50
Scrap rails for melting	11.75 to 12.25
Loose sheet clippings	8.50 to 9.00
Bundled sheets	9.50 to 10.00
Cast iron borings	8.00 to 8.50
Machine shop turnings	7.50 to 8.00
No. 1 busheling	10.00 to 10.50
No. 2 busheling	7.00 to 7.50
Rails for rolling	12.50 to 13.00
No. 1 locomotive tires	12.75 to 13.25
No. 1 railroad wrought	10.00 to 10.50
Short rails	15.75 to 16.25
Cast iron carwheels	12.25 to 12.75
No. 1 machinery cast	15.50 to 16.00
No. 1 railroad cast	13.00 to 13.50
Burnt cast	7.50 to 8.00
Stove plate	8.25 to 8.75
Brake shoes	9.50 to 10.25
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.50 to 12.00

Boston

Pig Iron Prices Unsettled—Scrap Market Weaker

BOSTON, March 27.—Little pig iron was sold in this territory in the past week. No open inquiry of importance is reported, but three or four fairly large consumers are sounding out the market for second and third quarter iron. Actual purchase will depend on the development of pending business with melters. Prices are unsettled owing to the possibility of reductions in rail and water freight rates. Buffalo iron is still available, figuring on all rail rates, at $16 a ton, base furnace, with differentials or at $16.50 with differentials waived. The Mystic Iron Works is meeting these prices on a delivered basis. Eastern Pennsylvania iron is generally $20 a ton, base furnace, but this price has been shaded on recent offers without resulting in orders. Alabama iron is steady at $16 a ton, base furnace. Proposed new rail rates from Troy, N. Y., to New England points figure out more to such points as Worcester and Springfield, Mass., and less to Long Island Sound points than existing rates. It is intimated that some low water rates from Buffalo to New England have been made for this summer.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.91
Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil. 1.75 to 2.25	25.71
Virginia, sil. 2.25 to 2.75	26.21
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Coke.—Indications are that New England by-product foundry coke ovens will bill out fuel next month against first half contracts at $11.50 a ton, delivered within a $3.10 freight rate zone, as they have in March. The movement of such coke shows little if any increase, an indication that the foundry melt is not increasing perceptibly. A still further contraction in the demand for domestic coke has come with warmer weather. Such coke is selling on a basis of $8.50 a ton on cars ovens, Everett, Mass.

Warehouse Business.—Structural rivets, ½-in. and larger, have been advanced 25c. to $4.75 per 100 lb., base. Soft steel rivets are unchanged at 40 and 10 per cent off in full kegs. For less than full keg lots of a size, the discount is 40 per cent, an advance, and all manufacturers' extras for quantities must be added to the list price before deducting the discount. The movement of iron and steel out of warehouses is not as brisk as it was a month ago. Stove bolts are now 70 and 10 per cent off list.

Pipe.—The Warren Foundry & Pipe Co. was the successful bidder for the Springfield, Mass., pipe and special fittings requirements at $1,920.59. The Chapman Valve Mfg. Co., Springfield, was awarded the valves at $20,105.75, and the Rensselaer Valve Co., Troy, the hydrants at $476.50.

Cold-Rolled Strip.—Bookings for second quarter are generally in small tonnages, but the aggregate is fairly satisfactory.

Bars.—Steel bars are moving in fairly good volume at 1.85c. to 1.90c. per lb., base Pittsburgh, for second quarter delivery. Buying of reinforcing bars for consumption is on a hand-to-mouth basis, with prices holding well at about 2.90c. per lb., base, from stock. Mills quote 1.90c. to 1.95c. per lb., base Pittsburgh.

Shapes and Plates.—Mills report a somewhat better demand for shapes and plates for second quarter delivery. No large jobs came up the past week for fabricators to figure, but there is a sizable amount of small work. Competition for small jobs is almost as keen as it is on large ones owing to the limited amount of business on fabricators' books.

Old Material.—Prices for machine shop turnings range from $5 a ton on cars, shipping point, to $5.75, with the general quotation $5 to $5.50, a drop of 50c. as compared with a week ago, and of 75c. within a fortnight. Buying is confined to one Pennsylvania steel mill, which accounts for the weakness of prices. Quotations on other materials are about the same as a week ago, but the market is generally weak. The Mystic Iron Works has taken additional tonnages of stove plate and sheared pipe at $10 a ton, delivered. Other recent sales include cotton ties at $6 to $6.50 a ton on cars, shipping point; heavy cast iron at $11; No. 2 steel at $7.25 to $7.50; textile machinery cast at $14 a ton, delivered, and No. 1 machinery cast at $14.50 and $15.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

The Boston & Maine Railroad has closed bids on 65 cars of miscellaneous material.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.00 to $9.10
Scrap T rails	8.00 to 8.50
Scrap girder rails	7.50 to 8.00
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought	8.00 to 8.50
Machine shop turnings	5.00 to 5.50
Cast iron borings (steel works and rolling mill)	6.00 to 6.25
Bundled skeleton, long	5.50 to 6.00
Forge flashings	6.00 to 6.50
Blast furnace borings and turnings	5.75 to 6.25
Forge scrap	6.00 to 6.50
Shafting	13.00 to 13.50
Steel car axles	15.00 to 15.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.50 to 8.25
Rails for rolling	10.00 to 10.50
Cast iron borings, chemical	9.00 to 9.50

Prices per gross ton delivered consumers' yards:

Textile cast	$13.50 to $14.00
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	9.50 to 10.00
Railroad malleable	13.00 to 13.50

Detroit

Industrial Activity Continues Upward—Motor Car Production Increasing

DETROIT, March 27.—Industrial activity in the Detroit area continues upward, with a corresponding increase in steel inquiries and bookings. Automobile production is constantly developing new "highs," with no apparent slowing down in sight, at least during the first half of the year.

The Hudson Motor Car Co. will end March with a production of better than 35,700, which will bring the total for the first quarter to 90,000 units. April estimates run between 39,000 and 40,000 units, with a tentative schedule of 110,000 units for the second quarter.

The Willys-Overland Co. is now turning out about 1300 cars per day. The February total of 24,017 cars has already been surpassed, with a volume of unfilled orders still amounting to 31,000 cars. It is estimated that Willys-Overland will reach a 1500 unit per day production by May 1.

Cadillac's production for the first two months of this year amounted to 3083, to which may be added 2754 units for LaSalle. This compares with 2692 units for the same period of 1927.

The Hupp Motor Car Co. is breaking all its previous records with 17,670 units, the total production for the four months ending Feb. 29, which is a 73 per cent increase over the same period a year ago.

The Graham-Paige Motors Co. has attained a production thus far of 285 cars a day. This compares with 161 cars as the highest daily production attained in 1927. The Graham-Paige plant now has a payroll of 480 more than was ever attained in the past.

Employment generally in Detroit increased 3453 for the week ended March 20. This brings the total industrial employment to 365,124.

The past week has shown an encouraging increase in structural steel orders, the demand being almost entirely for industrial structures. Small fabricating shops are particularly active, and a fair volume has been done in the larger structural units. Prices for shapes continue firm at 1.90c., Pittsburgh, for spot deliveries and 1.85c. on contract.

With automobile production on the highest basis for the year, the tonnage of scrap from the largest producers is likewise at a high point. Current orders are sufficient to absorb this tonnage, but there have been no evidences of strengthening in the market on old material.

Dealers' buying prices per gross ton, f.o.b. cars. Detroit:

Heavy melting and shoveling steel	$11.00 to $11.50
Borings and short turnings	7.25 to 7.75
Long turnings	6.75 to 7.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.50 to 21.00
Hydraulic compressed sheets	9.75 to 10.25
Stove plate	11.00 to 12.00
No. 1 busheling	8.50 to 9.00
Sheet clippings	6.00 to 7.00
Flashings	9.25 to 9.75

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Buffalo

Small-Lot Inquiry for Pig Iron—Steel Demand Holds

BUFFALO, March 27.—The only pig iron inquiries now being figured are small lots, except that the General Electric Co. inquiry for 2900 tons is said still to be open. Some misunderstanding apparently has arisen over Buffalo prices in connection with barge canal shipments. One lot, which was said to have been sold at a price figuring back to $15.50, Buffalo, on the basis of rail delivery, was actually sold, it is stated, for barge canal shipment, so that the maker will net $16.50, Buffalo, and possibly better. This price was made for No. 2X; some No. 1 iron went into the same transaction at $17, Buffalo. One Buffalo maker declines to quote less than $17 for No. 2 plain, 1.75 to 2.25 silicon, for any delivery.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2 foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	$17.00 to 17.50
Basic	16.50 to 17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—There is a good demand for bars, shapes and plates. Prices are holding. Sheet mill operation has increased to 90 per cent of capacity and sheets are firm at 2.90c. for black and 4.15c. for automobile body. Inquiry for sheets is good. Reinforcing bar business is quiet this week and there are no lettings of size.

Old Material.—The market shows a heavy consumption of material, but there has been little new buying. The large orders recently placed are taking most of the available scrap, and there is considerable activity among dealers in this connection. Dealers are offering $12.75 to $13.25 for No. 2 steel and $14.50 to $15 for No. 1. Some machine shop turnings have been sold at Niagara Falls at a delivered price of $9.75. Borings and turnings are weaker, with some tonnage of this material coming through from Detroit.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.75 to $15.25
No. 2 heavy melting steel	13.00 to 13.50
Scrap rails	13.75 to 14.25
Hydraulic compressed sheets	13.25 to 13.75
Hand bundled sheets	9.00 to 9.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.25 to 13.75
Heavy steel axle turnings	12.50 to 12.75
Machine shop turnings	8.50 to 9.00
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.50 to 16.00
Railroad coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phosphorus billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.25
Blast Furnace Grades	
Short shoveling steel turnings	10.50 to 11.00
Short mixed borings and turnings	9.50 to 10.00
Cast iron borings	9.75 to 10.25
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	17.00 to 17.50
Iron axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	13.00 to 13.50
Locomotive grate bars	11.50 to 12.00
Steel rails, 3 ft. and under	17.00 to 17.25
Cast iron carwheels	13.00 to 13.50
Malleable Grades	
Railroad	15.00 to 15.25
Agricultural	15.00 to 15.25
Industrial	15.00 to 15.25

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Mar. 27	Mar. 26	Mar. 24	Mar. 23	Mar. 22	Mar. 21
Lake copper, New York	14.20	14.20	14.20	14.20	14.20	14.25
Electrolytic copper, N. Y.*	14.00	14.00	13.82	13.82	13.82	13.82
Straits tin, spot, N. Y.	52.75	53.00	....	53.62½	53.50	53.87½
Lead, New York	6.00	6.00	6.00	6.00	6.00	6.00
Lead, St. Louis	5.82½	5.82½	5.80	5.80	5.80	5.80
Zinc, New York	6.07½	6.07½	6.07½	6.07½	6.07½	6.05
Zinc, St. Louis	5.72½	5.72½	5.72½	5.72½	5.72½	5.70

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, March 27.—There have been very few developments in any of the markets. Copper has a better tone after a week of inactivity and some shading. Tin has quieted down with prices steady. Very little change is noted in lead or zinc.

Copper.—The softer tendency, noted last week, persisted until yesterday and today, when a stronger tone developed. There is better inquiry from both domestic and foreign consumers, with considerable buying by the latter. For most of the week the light demand has been satisfied by one or two sellers at concessions down to as low as 14.07c., delivered, but it is believed that most of this metal, pressing on the market, has been absorbed. Today electrolytic copper is quoted quite firm at 14.12½c., delivered in the Connecticut Valley. The official quotation of Copper Exporters, Inc., is unchanged at 14.50c., c.i.f., European ports. Lake copper has been dull most of the week, but a better inquiry is reported today. Sales have been made at 14.15c. to 14.25c., delivered.

Tin.—About 1600 tons changed hands during the week ended Saturday, March 24. This is in decided contrast with the exceedingly active week just preceding when 3000 tons was sold. At that time consumers were the chief buyers, but during the week just passed dealers took most of the metal. The week was characterized by considerable profit taking which had a depressing effect upon the market here. Yesterday dealers were again active, 200 tons changing hands. The unfavorable feature of the situation is the lack of interest from consumers. Today the market was only moderately active, with spot Straits tin quoted at 52.75c., New York. Prices in London today were considerably higher than a week ago, with spot standard quoted at £239 17s. 6d., future standard at £239 5s. and spot Straits at £243 17s. 6d. The Singapore price today was £244 10s. It is to be noted that whereas a week ago future standard was at a premium over spot, the situation is reversed this week. Arrivals thus far this month have been 6195 tons with 7725 tons reported afloat.

Lead.—Buying in the West has been better than in the East and prices in St. Louis are a little higher at 5.82½c. Orders have been of fairly large proportions in the Middle West. The market is quieter here and the contract price of the leading interest is unchanged at 6c. There is considerable buying interest for April and May with earlier positions in good demand. An absence of selling interest in future positions is noted.

Zinc.—Only moderate activity is reported and prices have held steady at 5.70c., St. Louis, for nearby delivery, and 5.72½c., for April. This is due largely to the attitude of sellers which is averse to pressing metal on the market. There has, however, been some anxiety to sell March metal. Ore declined last week $2 per ton to $38, Joplin, with sales small at 4990 tons and output again restricted to about 9000 tons.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Antimony.—It is reliably reported that the Ford Motor Co. will abandon the manufacture of storage batteries and this is expected to affect ultimately the antimony market. Quotations are lower, due largely to pressure to sell, with Chinese metal for spot delivery

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	55.00c. to 56.00c.
Tin, bar	57.00c. to 58.00c.
Copper, Lake	15.25c.
Copper, electrolytic	15.00c.
Copper, casting	14.25c.
Zinc, slab	6.75c. to 7.25c.
Lead, American pig	7.00c. to 7.50c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	12.50c. to 13.00c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	34.50c. to 35.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	59.75c.
Tin, bar	61.75c.
Copper, Lake	14.85c.
Copper, electrolytic	14.85c.
Copper, casting	14.00c.
Zinc, slab	7.50c.
Lead, American pig	6.85c.
Antimony, Asiatic	16.00c.
Lead, bar	9.25c.
Babbitt metal, medium grade	19.75c.
Babbitt metal, high grade	63.50c.
Solder, ½ and ½	34.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.50c. to 19.25c.
Copper, hot rolled	22.75c. to 23.75c.
Copper, cold rolled, 14 oz. and heavier	25.25c. to 26.25c.
Seamless Tubes—	
Brass	23.37½c. to 24.37½c.
Copper	24.50c. to 25.50c.
Brazed Brass Tubes	26.50c. to 27.50c.
Brass Rods	16.25c. to 17.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open	10.50c. to 11.00c.

Non-Ferrous Rolled Products

The leading interest on March 26 reduced its quotation on zinc sheets 1c. per lb., the base price now being 8.50c. per lb. Mill prices on bronze, brass and copper products are unchanged and lead full sheets are holding at the prices announced Feb. 21.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Zinc	8.50c.
Lead (full sheets)	9.75c. to 10.00c.
Seamless Tubes—	
High brass	23.62½c.
Copper	24.50c.
Rods—	
High brass	16.50c.
Naval brass	19.25c.
Wire—	
Copper	15.75c.
High brass	19.25c.
Copper in Rolls	21.75c.
Brazed Brass Tubing	26.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Copper, cold rolled, 14 oz. and heavier	25.00c.
Zinc	11.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.12½c.
Copper	26.00c.
Brazed Brass Tubes	26.75c.
Brass Rods	16.50c.

quoted at 10c., New York, duty paid, and futures at 9.87½c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, March 27.—Sales are more numerous and prices are stronger. The supply of old metals is large, but little consumer interest is being shown.

Prices, per lb., in carload lots: Lake copper, 14.25c.; tin, 55c.; lead, 6c.; zinc, 5.85c.; in less-than-carload lots, antimony, 12.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 9.25c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.25c.; pewter, No. 1, 30c.; tin foil, 36c.; block tin, 45c.; aluminum, 11.75c.; all being dealers' prices for less-than-carload lots.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.00c.	13.50c.
Copper, heavy and wire	11.75c.	12.875c.
Copper, light and bottoms	10.00c.	11.25c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	9.50c.	10.625c.
No. 1 yellow brass turnings	7.75c.	9.00c.
No. 1 red brass or composition turnings	8.75c.	9.75c.
Lead, heavy	5.00c.	5.50c.
Lead, tea	4.00c.	4.50c.
Zinc	3.25c.	3.75c.
Sheet aluminum	12.50c.	14.50c.
Cast aluminum	12.50c.	14.00c.

FABRICATED STRUCTURAL STEEL

New Work Will Require 33,000 Tons—Awards Continue to Decline, Totaling 24,425 Tons

NEW projects amounting to 33,000 tons were the feature of the structural market in the last week, although the total was somewhat below the weekly average for the year. Of outstanding size were an apartment building in New York and a bridge across the Delaware River near Philadelphia, which will require 8000 tons each. Awards amounted to 22,400 tons, one of the lowest totals for the year, the largest of which was a manufacturing building at Chicago taking 4500 tons. Awards follow:

STATE OF VERMONT, 150 tons, three bridges, to American Bridge Co.

NORTH ADAMS, MASS., 140 tons, bridge, to Jordan Construction Co., Albany.

BOSTON, 100 tons, artificial ice making plant, Boston Ice Co., to New England Structural Co.

NASHUA, N. H., 100 tons, publishing plant, to New England Structural Co.

NASHUA, 100 tons, mercantile building, to New England Structural Co.

HARTFORD, CONN., 400 tons, office building, to Standard Structural Co.

MIDDLETOWN, CONN., 600 tons, savings bank, to Levering & Garrigues Co.

NEW HAVEN, CONN., 1600 tons, power house for New Haven Illuminating Co., to Levering & Garrigues Co.; reported last week to an unnamed fabricator.

NEW YORK, 1000 tons, loft building at 347 West Thirty-ninth Street, to Levering & Garrigues Co.

NEW YORK, 900 tons, theater and office building on Fifty-third Street, to George A. Just Co.

NEW YORK, 400 tons, apartment building on East Forty-third Street, to Harris Structural Steel Co.

NEW YORK, 300 tons, building for New York Genealogical and Biographical Society at 122 West Fifty-eighth Street, to Harris Structural Steel Co.

STATE OF PENNSYLVANIA, 200 tons, bridge over Tioga River, to American Bridge Co.

WINSTON-SALEM, N. C., 3000 tons, building for Reynolds Tobacco Co., to Virginia Bridge & Iron Co.

TUSCALOOSA, ALA., 100 tons, Libby, McNeil & Libby milk condensary, to Ingalls Iron Works Co.

CHATTANOOGA, TENN., 100 tons, Lookout Boiler & Tank Co. addition, to Southern Steel Works, Birmingham.

LOUISVILLE & NASHVILLE RAILROAD, 830 tons, bridges; 670 tons to Bethlehem Steel Co. and remainder to Virginia Bridge & Iron Co. and Ingalls Iron Co.

MCKEESPORT, PA., 250 tons, County highway bridge, to Fort Pitt Bridge Works.

PITTSBURGH, 100 tons, Emory Memorial Church extension, to Pittsburgh-Des Moines Steel Co.

YOUNGSTOWN, OHIO, 350 tons, power house for Youngstown Sheet & Tube Co., to Pittsburgh-Des Moines Steel Co.

BAY CITY, MICH., 1250 tons, Chevrolet Motor Co. buildings, to Flint Structural Steel Co.

DETROIT, 1100 tons, Chevrolet gear and axle plant, to Whitehead & Kales.

PONTIAC, MICH., 800 tons, Riker Building, to Whitehead & Kales.

JACKSON, MICH., 200 tons, for Fox, Withington Co., to Whitehead & Kales.

FORT WAYNE, IND., 400 tons, warehouse for International Harvester Co., to Rochester Bridge Co., Rochester, Ind.

CHICAGO & ILLINOIS MIDLAND RAILROAD, 530 tons, bridges, to American Bridge Co.

CHICAGO, 135 tons, tunnel car bodies for Department of Public Works, to Gage Structural Steel Co.

CHICAGO, 120 tons, coal trestle for city pumping plant, to Midland Structural Steel Co., local.

CHICAGO, 4500 tons, Palm Olive-Teet building, to an unnamed bidder.

EVANSTON, ILL., 180 tons, public school, to an unnamed bidder.

MILWAUKEE, 1580 tons, County portion of Milwaukee Public Safety Building, to Lakeside Bridge & Steel Co.

EAST ST. LOUIS, ILL., 150 tons, building for American Zinc Co., to Mississippi Valley Structural Steel Co.

ST. LOUIS, 750 tons, building for Missouri Valley Portland Cement Co., to Mississippi Valley Structural Steel Co.

LOS ANGELES, 295 tons, shapes, apartment building at 308 North Sycamore Street, to Brombacher Iron Works.

CULVER CITY, CAL., 150 tons, City Hall, to McClintic-Marshall Co.

SAN FRANCISCO, 165 tons, apartment building at Bay and Polk Streets, to McClintic-Marshall Co.

SAN FRANCISCO, 3000 tons, Coyote Point bridge across San Francisco Bay, to Virginia Bridge & Iron Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

WEST BOYLSTON, MASS., 130 tons, bridge.

NEW YORK, approximately 8000 tons, units 8 and 9 of Tudor City; plans soon.

HUNTINGTON, L. I., 800 tons, Catholic Church.

NEW YORK CENTRAL RAILROAD, 400 tons, bridges.

METUCHEN, N. J., 425 tons, power station for Public Service Corporation.

STANDARD OIL CO. OF NEW JERSEY, 400 tons, tanks.

WILLIAMSPORT, PA., 500 tons, Y. W. C. A.

PHILADELPHIA, 400 tons, building for Kensington Trust Co.

PHILADELPHIA, 800 tons, Nurses' Home at Frankford Hospital.

PHILADELPHIA 8000 tons, Tacony-Palmyra bridge; bids open April 2.

PHILADELPHIA 400 tons, building for Terminal Title & Trust Co.; Roberts & Roller, Philadelphia, general contractors.

PHILADELPHIA 2400 tons, Navy Central Y. M. C. A.; Irwin & Leighton, Philadelphia, general contractors.

ELMIRA, N. Y., 500 tons, Mark Twain High School.

CORAOPOLIS, PA., 800 tons, County bridge repairs; Farris Engineering Co., general contractor.

MEMPHIS, TENN., 3500 tons, 29 barges for Mississippi River Commission for Mississippi flood repair work; bids close March 30.

MEMPHIS, TENN., 550 tons, Starrett Building.

CLEVELAND, 1000 tons, two bridges for Cleveland Union Terminals Co.; bids taken.

DETROIT, 1100 tons, Detroit's section of river tunnel.

STATE OF MICHIGAN, 120 tons, State highway bridge, over Cedar Creek, Muskegon County; Massillon Bridge & Structural Co., low bidder.

CHICAGO, 1800 tons, building for Chicago Motor Club; Holabird & Roche, architects.

CHICAGO, 240 tons, temporary building for Board of Trade; Holabird & Roche, architects.

ROCK ISLAND, ILL., 500 tons, repairs to the Rock Island railroad bridge across Mississippi River.

SAUKVILLE, WIS., 200 tons, State highway bridge over Milwaukee River; bids close April 4.

OGDEN, UTAH, 650 tons, train shed for Union Pacific Railroad.

REINFORCING STEEL

Awards of 13,000 Tons—4000 Tons in New Projects

STATE OF NEW JERSEY, 200 tons, road work, from Jennerone Contracting Co., general contractor, to Igoe Brothers.

PHILADELPHIA, 275 tons, school at Sixth and Buttonwood Streets, to Robinson Iron & Steel Co.

HARRISBURG, PA., 310 tons, Market Street subway, to McClintic-Marshall Co.

JOHNSTOWN, PA., 425 tons, municipal retaining wall work, to Carlem Engineering Co., Pittsburgh.

PITTSBURGH, 300 tons, William Penn Hotel addition, to Kalman Steel Co.

DAVIDSON, N. C., 120 tons, Davidson College, to Connors Steel Co., Birmingham.

CLEVELAND, 1000 tons, two store and warehouse buildings for Sears, Roebuck & Co., to Truscon Steel Co.

DAYTON, OHIO, 800 tons, hotel, to Joseph T. Ryerson & Son, Inc.

CHICAGO, 1000 tons of rail and billet steel bars, printing plant for Reuben H. Donnelley Corporation, to Joseph T. Ryerson & Son, Inc.

CHICAGO, 260 tons of rail steel bars, apartment building at 1500 Lake Shore Drive, to Calumet Steel Co.

CHICAGO, 400 tons of rail steel bars, garage at Federal and Lake Streets, to Inland Steel Co.

CHICAGO, 250 tons, building for Rapid Roller Mfg. Co., to Barton Spiderweb System.

OAK PARK, ILL., 700 tons, Nicholas stores, to Barton Spiderweb System.

CHICAGO, 500 tons, sewer work on Northwest side, to Barton Spiderweb System.

CHICAGO, 600 tons, apartment building on Oglesby Avenue, to Olney J. Dean & Co.

STATE OF ILLINOIS, 300 tons, bridge and road work, to Calumet Steel Co.

ST. LOUIS, 650 tons, apartment house at 4401 West Pine, 350 tons; warehouse for Great Atlantic & Pacific Tea Co., 300 tons, to Missouri Rolling Mills Corporation.

PORTLAND, ORE., 750 tons, Veterans' Hospital, to Pacific Coast Steel Co.

SAN FRANCISCO, 1950 tons, for Pier 48, to San Francisco jobber.

SAN FRANCISCO, 1000 tons, for Ocean Beach Esplanade, to Gunn, Carl & Co.

SAN FRANCISCO, 125 tons, factory, Fifteenth and Potrero Streets, to Badt Falk Co.

SANTA MONICA, CAL., 210 tons, office building, Seventeenth and Wilshire Boulevard, to unnamed interest.

LOS ANGELES, 340 tons, apartment building at 5930 Franklin Avenue, to an unnamed bidder.

SEATTLE, 225 tons, hotel, Fourth and Spring Streets, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BROOKLYN, 150 tons, telephone building; bids not in.

NEW BRUNSWICK, N. J., 1700 tons, Raritan River bridge; bids April 9.

PHILADELPHIA 800 tons, addition to Alden Park Manor apartments; bids in.

CUMBERLAND, MD., 175 tons, building for Cumberland Hospital.

QUANTICO, VA., 600 tons, Marine barracks.

PITTSBURGH, 250 tons, Koppers Building; Mellon-Stuart Co., general contractors.

CLEVELAND, 190 tons, Henry Street viaduct; general contract awarded to Great Lakes Construction Co.

CHICAGO, 200 tons, building at 301 West Jackson Boulevard; McLennan Construction Co., general contractor.

ST. LOUIS, 200 tons, Knights of Pythias temple at Grand and Lindell Boulevards.

Dial Indicating Gages

(*Concluded from page* 881)

illustrated, the adapter carries an interchangeable square plate, with one measuring point and three points of abutment, formed by its crowned corners. Different plates are substituted for different diameters. The movable measuring point moves diagonally and its movement, considerably magnified, is transmitted to the indicator needle. The fixed gages are intended for mass production of one or two lines, and the self-accommodating gages for use on a greater variety of work. The Mikrotast and measuring base of both types are connected by an adapter and for deep holes extension rods are provided. It is claimed for these internal gages that control of every part of a bore is possible, and that blind holes may be checked to the bottom. Any deviation from the standard diameter is indicated by the indicator needle. A special self-accommodating gage with long extension rods is available for checking deep holes. Several of these rods, each 1250 mm. in length, can be connected.

External taper gaging is performed with accuracy by gages which consist of interchangeable Mikrotasts and two saddles that are securely connected by a rigid bridge piece, with narrow locating flats and stop plate from which the work is registered. This gage is said to give instantly in actual measurement the errors in diameter as compared with a master to which it has been previously set.

For checking internal tapers two Mikrotast internal gages are required, one each at the top and bottom of the taper respectively. They have special stop plates with adjusting and clamping screws. To adjust these gages the stop plates are placed against the face of the master and clamped in position, after having adjusted the Mikrotast needle and limit pointers. Upon entering the gage into the work, the indicator needle will show the deviation from the master. Where the slides of the machine on which the work is mounted accurately control the angle of the taper produced, only one gage is needed for checking the taper.

Pitch and root diameters of external threads are checked by Mikrotasts which are used in conjunction with saddles fitted with suitable locating pieces and gaging points. Pitch, root and outside diameters of right- and left-hand taps with three or four flutes from 6 mm. up are checked by the gage shown in the illustration. The Mikrotast is fitted to an annular frame with two interchangeable locating fixed points and one movable gaging point. An advantage claimed for these gages is the constant and even pressure during the gaging, due to the weight of the instrument.

The foot of the gage for measuring effective diameters of internal threads has one fixed abutment and, exactly opposite, a movable measuring contact point, the movements of the latter being transferred to the dial indicator needle. Both are ball shaped and adjusted to engage on the line of the effective diameter. A bush slightly less in diameter than the bore is placed over the gaging foot as a center of support. A separate gaging foot and bush are required for gaging various diameters. They are suitable for gaging right- or left-hand threads from ½ in. up.

The gages for measuring pitch diameters on internal threads up to 2 in. are supplied with interchangeable measuring bolts. Gages are also available for threads larger than 2 in. and other for checking the pitch of external threads.

PERSONAL

Herbert Hoover, Secretary of Commerce, has been appointed a member of the endowment committee for the Engineering Foundation and Engineering Societies Library and its executive subcommittee. Secretary Hoover is a past-president of the American Institute of Mining and Metallurgical Engineers, a member of the American Society of Mechanical Engineers and an honorary member of the American Society of Civil Engineers.

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Harold P. Sigwalt, vice-president of the National Industrial Advertisers' Association, who has been advertising manager for the Milwaukee Corrugating Co., Milwaukee, has resigned from the latter position to become associated with the Cramer-Krasselt Co., Milwaukee.

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A. Oram Fulton, president Wheelock, Lovejoy & Co., Inc., Cambridge, Mass., will return on the Berengaria, March 30, from a two months' European trip.

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W. W. Wilson, recently one of the receivers of the Milton Mfg. Co., Milton, Pa., has been elected president of the company to serve until a meeting of the new stockholders. At that time a board of directors will be elected, who will in turn elect officers.

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M. D. Troyer has been made manager of the logging machinery department of the Clyde Equipment Co., Portland, Ore., succeeding J. B. Stam, who was recently made manager of the company's Seattle branch. Mr. Troyer for a number of years has been associated with the Clyde Iron Works, Duluth, Minn., for the last five years having been district manager for that company at Vancouver, B. C.

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R. C. Bird, formerly with the Chain Belt Co., Milwaukee, has joined the sales department of the D. O. James Mfg. Co., Chicago, maker of speed reducers and cut gearing, and will serve as traveling sales manager.

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Milton C. Ryer, for 24 years manager of the Denver, Colo., branch of the Crucible Steel Co. of America, is now representing the Ryer Co., 124 West Fourth Street, Los Angeles, representative in western United States and Mexico for the United Swedish Steel Works, Sweden, and the Heppenstall Forge & Knife Co., Pittsburgh.

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Gilbert Butler, secretary of the Bossert Corporation, Utica, N. Y., recently returned from a business trip abroad.

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Walter Harnischfeger, vice-president Harnischfeger Corporation, Milwaukee, has returned from a three months' tour of Central America and Colombia.

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F. H. Clauson, president Van Brunt Mfg. Co., Horicon, Wis., maker of farm machinery and tools, and president Wisconsin Manufacturers Association, will uphold the negative of the question, "Does Industry Need Collective Bargaining Through Trade Unionism?" in a debate with John P. Frey, Washington, former editor the *International Molders' Journal*, before the Intergroup Forum of the Milwaukee State Teachers' College on March 28.

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Charles S. Belsterling has been appointed chairman of the traffic committee of the United States Steel Corporation, succeeding John S. Keefe, who recently became president of the American Steel & Wire Co. Mr. Belsterling has been associated with the Steel Corporation and its subsidiaries for many years, having been originally in the general sales department of the A. & P. Roberts Co. At the formation of the American Bridge Co. he became executive head of the traffic department. Later he was made a member of the legal staff of the Steel Corporation in the capacity of general commerce attorney in charge of traffic and transportation matters. Mr. Belsterling is a member of the bar of Pennsylvania and of New York and of the Supreme Court of the United States.

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R. P. Dieckelman has been elected vice-president of the Pressed Steel Tank Co., Milwaukee, and Herman Merker, secretary.

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Thomas S. Hammond, president Whiting Corporation, Harvey, Ill., was elected president of the Chicago branch of the National Metal Trades Association at its thirteenth annual dinner meeting, March 22. Sterling Morton, president Morkrum-Kleinschmidt Corporation, was elected vice-president, and Arthur E. Blackwood, vice-president Sullivan Machinery Co., treasurer. The directors are J. D. Cunningham, president Republic Flow Meter Co.; Charles E. Finkl, general manager A. Finkl & Sons Co.; William Ganschow, vice-president Gars & Forgings, Inc.; Warren G. Jones, president W. A. Jones Foundry & Machine Co.; W. H. Kent, president Weller Mfg. Co., and Charles H. Strawbridge, president Goodman Mfg. Co.

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H. D. Jenkins has been appointed Chicago district representative for the Elliott Blair Steel Co., New Castle, Pa., maker of cold-rolled strip, and of the American Nickeloid Co., Peru, Ill., manufacturer of nickel-plated zinc, copper and tin, copper-plated zinc and tin and nickel-plated cold-rolled strip. His offices are at 1520 Otis Building.

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E. J. Kulas, president Otis Steel Co., Cleveland, has renewed an agreement with that company under which he will continue as its president until Dec. 31, 1929.

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M. C. Summers and S. P. Ker, Jr., formerly president and vice-president and general sales manager respectively of the Thomas Sheet Steel Co., Niles, Ohio, have become affiliated with the sales organization of the Empire Steel Corporation, Mansfield, Ohio. Mr. Summers will be connected with the Mansfield office and will specialize in the sale of galvanized sheets and Mr. Ker will be identified with the Cleveland sales office.

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Paul Wick, formerly vice-president of the Falcon Steel Co., Niles, Ohio, has been elected vice-president in charge of sales of the Youngstown Boiler & Tank Co., Youngstown.

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George C. Brainard, who has been vice-president in charge of operations of the General Fireproofing Co., Youngstown, Ohio, manufacturer of metal furniture and steel shelving, has been elected president of that company, succeeding W. H. Foster, who has been made chairman of the board of directors. Mr. Brainard was formerly associated with the Hydraulic Steel Co., Cleveland.

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T. M. Girdler, president Jones & Laughlin Steel Corporation, Pittsburgh, has been elected a director of the Union National Bank in that city.

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Henry F. Schmidt, consulting engineer at the South Philadelphia works, Westinghouse Electric & Mfg. Co., has been awarded the medal of the American Society of Naval Engineers for the best article submitted during 1927. He has also been given an honorary life membership in the society and a cash prize for his paper, entitled "Some Screw Propeller Experiments with Particular Reference to Pumps and Blowers." The presentation of the awards will be made by Secretary Wilbur at the annual dinner of the society, to be held March 29 at the Willard Hotel, Washington.

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E. E. Arnold again has become associated with the Westinghouse Electric & Mfg. Co., East Pittsburgh, as mechanical engineer for special assignment. For 10 years following his graduation from Ohio State University in 1898, he was with the Westinghouse Machine Co., and was engineering assistant to the vice-president when he resigned to become chief engineer of the Metal Products Co., Detroit. Subsequently he was consulting

engineer A. O. Smith Corporation, Milwaukee; vice-president Standard Screw Products Co., Detroit, and chief engineer New Departure Mfg. Co., Bristol, Conn.

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Jacob F. Savela has been appointed welding service manager in the Detroit district for the Lincoln Electric Co., Cleveland, and will work under the direction of J. M. Robinson, Detroit district sales manager for the Lincoln organization.

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John Keenan, general superintendent of the Tata Iron & Steel Co., who left India about a month ago, arrived in New York from England on March 27 for a stay of two or three months in the United States. His headquarters will probably be at the offices of Perin & Marshall, consulting engineers, New York.

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H. Oliver Williams has been appointed director of production for the J. Elliott Hall agency of the Penn Mutual Life Insurance Co., 50 Church Street, New York. He has had many years of experience in sales, system and personnel work, having been associated during the last 20 years with the Carnegie Steel Co., the Midvale Steel & Ordnance Co., and the Bethlehem Steel Corporation.

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A. O. Jones, president United States Register Co., Battle Creek, Mich., has been elected president of Lubrication Devices, Inc., Battle Creek, recently formed by a reorganization of Farmer Lubrication Systems, Inc., Detroit. The company will occupy its new plant at Battle Creek about April 15, and will engage in the manufacture of Farmer centralized lubrication systems for the industrial and automotive fields. Other officers are Charles C. Green, president City National Bank, Battle Creek, vice-president; L. E. Gordon, treasurer; P. J. Daniels, formerly purchasing agent Duplex Printing Press Co., Battle Creek, secretary; A. J. Jennings, recently manager of the lubrication division of E. F. Houghton & Co., Philadelphia, sales manager, and A. J. Farmer, chief engineer.

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N. A. Hall of the Sprague Hoist Division, Shepard Electric Crane & Hoist Co., New York, and H. J. Fuller, Yale & Towne Mfg. Co., Stamford, Conn., were elected chairman and vice-chairman respectively of the Electric Hoist Manufacturers' Association at a meeting held recently in New York.

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Rhys T. Harris, for many years identified with the operating departments of several steel companies, has joined the sales department of the Globe Brick Co., East Liverpool, Ohio, and will specialize in ladle brick for open-hearth and blast furnace use.

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John S. Casey has been elected president of the Treadwell Construction Co. and the Midland Barge Co., Midland, Pa., succeeding the late Samuel N. Craig. Mr. Casey has long been identified with the Treadwell interests, with which these two companies are affiliated, having been president for several years of the M. H. Treadwell Co., New York, and the Treadwell Engineering Co., Easton, Pa. He will continue to make his headquarters in New York. B. W. Hunsicker, who is secretary and treasurer of the construction company and treasurer of the barge company, will be the active head of both companies at Midland.

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Einar Ryden, who has been connected with the Northwest Engineering Co., Green Bay, Wis., is now associated with the Link-Belt Co., 310 West Pershing Road, Chicago, as a machine designer.

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J. Ross Pilling of the pig iron, coal and coke firm of Pilling & Co., Inc., Philadelphia, has become identified with Geare, Marston & Pilling, Inc., Philadelphia, a newly organized advertising agency. Mr. Pilling, who is a son of W. S. Pilling, president of the firm bearing his name, will retain his interest in and continue as vice-president of Pilling & Co., Inc.

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Robert J. Deneen and Frederic Attwood have been elected vice-presidents of the Ohio Brass Co., Mansfield, Ohio. Mr. Deneen is in charge of the company's sales in the Chicago district and Mr. Attwood serves in a similar capacity for the Eastern district, with headquarters in New York.

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G. O. Carlson has resigned as superintendent of the cylinder department of William Wharton, Jr., & Co., Inc., Easton, Pa., and has joined the sales department of the Latrobe Electric Steel Co., 8 West Fortieth Street, New York.

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Edward H. Branson, assistant to the chief engineer in the Pittsfield, Mass., works laboratory of the General Electric Co., has resigned and early in April will take charge of the new testing and research laboratory of the General Railway Signal Co., Rochester, N. Y. He is a graduate of Union College, Schenectady, N. Y., and in 1912 entered the employ of the General Electric Co. at its Schenectady plant. In 1913 he was transferred to Pittsfield, where he has since remained, with the exception of a period during the World War, when he served with the United States Ordnance Department at Washington.

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Fred C. Conners has resigned as secretary, assistant treasurer and a director of A. M. Castle & Co., 1300 North Branch Street, Chicago, iron and steel warehouse, and has been succeeded as secretary and a director by Leonard J. Quetsch.

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William K. Capers, who has been engaged in tank sales at Pittsburgh, New York and Chicago for the William B. Scaife & Sons Co., Oakmont, Pa., has been appointed manager of the company's Chicago office in the First National Bank Building, succeeding Charles F. O'Hagan. At present Mr. Capers will not relinquish any of the territory which he formerly covered.

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C. Snelling Robinson, vice-president Youngstown Sheet & Tube Co., Youngstown, addressed the New York section of the American Institute of Mining and Metallurgical Engineers, March 22, on iron mining problems. In connection with the talk he presented for the first time a film entitled "The Story of Iron," taken by the Bureau of Mines at the mines and blast furnace plants of Pickands, Mather & Co., the Youngstown Sheet & Tube Co. and the Bethlehem Steel Corporation.

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J. King Hoyt, Jr., of A. Milne & Co., 741 Washington Street, New York, steel merchants and importers, has returned from an extended visit at his firm's plant connections at Sheffield, England, Sweden, and in other Continental countries.

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Arthur Lowy, for a number of years vice-president and chief engineer of the New York Engineering Co., 75 West Street, New York, has been elected president of the company, succeeding the late A. C. Ludlum. F. N. Ludlum has been named vice-president, and George Sommer, secretary and treasurer.

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C. L. Wood, general manager of sales for the Carnegie Steel Co., recently sailed for an extended European tour.

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William S. Rogers, formerly president of the Rogers Brown Iron Co., Buffalo, is president and treasurer of the Alloy Boat Corporation, 190 Elk Street, Buffalo, which was formed recently to manufacture boats of aluminum alloy for use with outboard motors.

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Samuel M. Harrington has been elected president of the Frost Mfg. Co., Galesburg, Ill., manufacturer of steel heating boilers, to succeed W. S. Cameron.

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J. M. Woltz, Youngstown Sheet & Tube Co., Youngstown, Ohio, was elected president of the Society of Ohio Safety Engineers at the annual meeting held at the Hotel Cleveland, Cleveland, March 24. J. E. Roof, Willard Storage Battery Co., Cleveland, was elected vice-president; A. C. Cook, Carnegie Steel Co., Youngstown, secretary, and E. R. Rose, Republic Iron & Steel Co., Youngstown, treasurer.

OBITUARY

WILLIAM CAMERON SPROUL, former governor of Pennsylvania, who died at his home near Chester, Pa., on March 21, had long been prominent in industrial as well as political life in his native State. He was born at Octoraro, Lancaster County, Pa., Sept. 16, 1870, and attended Swarthmore College, Philadelphia, from which he was graduated in 1891. He first engaged in newspaper work, but soon extended his activities to the manufacturing field, organizing and serving as the first president of the Seaboard Steel Casting Co., now a part of the American Locomotive Co. He also organized and for many years served as chairman of the board of the General Refractories Co., Philadelphia. In this connection he took an active part in the formation of the American Refractories Institute, serving as its first president, and continuing as a director of the organization. He also aided in the development of the Lebanon Iron Co. and the Lackawanna & Wyoming Valley Railroad. His political career began when he was elected to the Pennsylvania Senate in 1896, and culminated with his election to the governorship in 1918.

W. C. SPROUL

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GAETANO LANZA, for nearly 40 years a member of the faculty of the Massachusetts Institute of Technology, Cambridge, and well known as a consultant in mechanics, died on March 22 at his home in Philadelphia, aged 79 years. He was born in Boston, but attended college in Virginia, serving for a time as an assistant instructor at the University of Virginia. He later joined the faculty of the Massachusetts technical school, where he was professor of theoretical and applied mechanics from 1875 until 1911, when he became professor emeritus of mechanics. Removing to Philadelphia he served as special consultant in mechanics for the Baldwin Locomotive Works and was for a time associate editor of the Franklin Institute Journal. He was active in the American Society for Testing Materials and in 1920 was made an honorary member of that organization.

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JAMES W. PACKARD, founder, first president and for many years directing head of the Packard Motor Car Co., Detroit, died on March 20 at the Cleveland Clinic Hospital, where he had been a patient since November, 1926. He was born at Warren, Ohio, in 1863 and was graduated in mechanical engineering from Lehigh University, Bethlehem, Pa., in 1884. After working for a time as superintendent of the incandescent department of a New York electrical company, he returned in 1890 to Warren, where he organized the Packard Electric Co., manufacturer of incandescent lamps. A few years later he became interested in automobile manufacture and in 1897 organized the Packard Motor Car Co., which was soon moved to Detroit. Mr. Packard had lived in comparative retirement since 1915, interesting himself in philanthropy and the advancement of medical sciences. His largest and most recent gift was $1,000,000 to Lehigh University for a mechanical and electrical engineer laboratory.

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WILLIAM C. FOWNES, vice-president of the Standard Seamless Tube Co., Pittsburgh, until its absorption early this year by Spang, Chalfant & Co., Pittsburgh, died March 24 at the Mayo Hospital, Rochester, Minn. Mr. Fownes was 70 years of age and with his brother, H. C. Fownes, had long been prominent in the steel industry of Pittsburgh. They were identified with the old Pittsburgh iron and steel firm of William F. Clark & Sons, and with the liquidation of that interest, they organized the Carrie Furnace Co., and built the Carrie furnaces at Rankin, Pa., which the Carnegie Steel Co. bought in 1898. They organized the Midland Steel Co., Midland, Pa., which was sold to the Pittsburgh Crucible Co. in 1911. In 1914 they founded the Standard Seamless Tube Co. at Ambridge, Pa. Other companies in which Mr. Fownes and his brother were interested were the Rust Boiler Co., Midland, Pa., which was acquired by the Babcock & Wilcox Co.; the Reliance Coke Co., Denbo, Pa., and the S. Jarvis Adams Co., started in Pittsburgh in the early days of the iron and steel industry, but later located at Midland, Pa., where it became the Pittsburgh Iron & Steel Foundries Co., which was merged with the Garrison Foundry Co. and then taken over by the Mackintosh-Hemphill Co.

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WILLIAM MELVILLE BOWMAN, president Somersworth Foundry Co., Salmon Falls, N. H., died suddenly March 25. He was born in Falmouth, Mass., 67 years ago, and at the time of his death was a director of the Salmon Falls State Bank and of the Somersworth National Bank.

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JOHN G. BRIERLY, president Brierly-Lombard Co., Worcester, Mass., formerly the Lombard Machinery Co., died recently in Florida.

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PETER J. MACNAMARA, president of the MacNamara-Koster Foundry Co., Indianapolis, died March 19, after a short illness.

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WOLCOTT REMINGTON, vice-president and a director of the Thompson Electric Welding Co., Lynn, Mass., died on March 20 at a Lynn hospital, following a week's illness, aged 53 years.

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WILLIAM BLACKWOOD SMITH, president, treasurer and one of the founders of the Smith & Caffrey Co., Syracuse, N. Y., structural steel fabricator, died at his home in that city on March 24, aged 68 years. He was born at Willimantic, Conn., June 22, 1860, and began his business career in Syracuse with the E. C. Stearns Co. In 1893 he became associated with James S. Caffrey, now vice-president of the Smith & Caffrey Co., in the firm bearing their names, continuing to be active in the company until his death.

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HALWARD G. WESTMORE, general forman A. O. Smith Corporation, Milwaukee, and associated with the company since 1895, died March 19 after a brief illness. He was born in Norway in 1852 and came to America in 1863. Mr. Westmore is credited with notable achievements in the establishment of the automatic pressed steel automobile frame shop in the Smith plant, described in THE IRON AGE last week.

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HENRY A. RUNKEL, president Security Lightning Rod Co., Burlington, Wis., died March 10, aged 59 years. He was president also of the Burlington National Bank and identified with other business interests.

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JOHN T. CORBETT, for many years head of Stadler & Corbett, Aurora, Ill., boiler manufacturers, and for 20 years head of the boiler department of Joseph T. Ryerson & Son, Inc., Chicago, died March 19 in Aurora. He was 77 years of age and had retired from the Ryerson company eight years ago.

Apparent consumption of babbitt metal in February is reported by the Department of Commerce at 4,470,368 lb., compared with 4,928,517 lb. in January. Except for December, the February total was the lowest for any month in more than three years. In February, 1927, it was 5,452,200 lb.

Machinery Markets and News of the Works

MARCH BUSINESS GOOD

Machine Tool Orders This Month Equal to February's

Detroit Automobile Company Buys $100,000 Worth of Special Lathes—German Order Amounts to $40,000

MACHINE tool business in March will equal that of February, and in a few instances will run ahead of that month. A Cincinnati manufacturer reports that bookings this month are the largest, with one exception, of any month since 1919. In the first quarter of the year some manufacturers have had about 50 per cent more business than in the corresponding period of 1927, but 25 per cent is perhaps more representative of the gain for the entire industry.

Business continues to come largely from the general industrial field. Automobile companies have not been buying as heavily as they usually do at this time of year, while the orders coming from the railroads have been unusually light.

Outstanding transactions of the week were $100,000 worth of special lathes bought by a Detroit automobile company and $40,000 worth of machines to be shipped to Germany. The Nash Motors Co., Kenosha, Wis., has ordered 18 presses, and a large press order has also been placed by the Stewart-Warner Speedometer Corporation, Chicago. The Allis-Chalmers Mfg. Co. has added about $15,000 worth of equipment to the plant of the Monarch Tractor Co., Springfield, Ill., which it recently acquired.

Business in prospect is in volume sufficient to encourage the belief that sales during April will not fall below those of this month. Particularly in the automobile industry is the outlook bright for the purchase of considerable shop equipment.

New York

NEW YORK, March 27.

MACHINE tool buying in this market has kept up during the past week at a pace which indicates that total sales for March will equal those of February. Most of the buying is in single tools, but demand is well scattered among nearly all classes of industrial buyers. Railroads are buying comparatively little, but the New York Central has asked for revised quotations on a number of tools, a move that may be the forerunner of early purchasing by that road. Orders for radial drills were fairly numerous during the week, buyers taking advantage of the brief period of protection given them on quotations outstanding when the recent price advances were announced. One of the dullest items in the machine tool list is lathes, demand for which has declined since the general price advances early in the year.

Among the week's sales were the following: Pratt & Whitney No. 2 jig borer to a Detroit automobile company; two 1 x 18-in. automatic lathes to a company in New Jersey; 36 to 44-in. side-head boring mill to Pratt & Whitney Aircraft Corporation, Hartford, Conn.; 3-ft. radial drill to Central Station Steam Co., Detroit; 3-ft. radial drill to a company in eastern Pennsylvania.

Used tools as follows were sold during the week: 16-in. lathe and a 3-spindle drilling machine to a company in Boston; 36 x 36-in. x 12-ft. Pond planer to a Detroit company; Niles 6-spindle floor boring machine to a company in Pennsylvania; 12 x 10-ft. x 26-in. Pond planer to a Pennsylvania company; 72 x 72-in. x 36-ft. Pond planer to a Pittsburgh company.

R. Hoe & Co., 504 Grand Street, New York, manufacturer of printing presses, saws, etc., is said to be planning a two-story addition to plant at Dunellen, N. J., to cost more than $75,000, and purposes to concentrate production at that location, removing all branch works. Additional equipment will be provided for increased output.

Bright Star Electric Co., New York, has been formed to take over and expand Bright Star Battery Co., with headquarters and plant on Fifteenth Street, Hoboken, N. J., manufacturer of dry batteries. New owner will continue production at same location and proposes to add to present line of output. A stock issue to total about $960,000 has been arranged, a portion of fund to be used for expansion. Battery company will maintain present identity as a subsidiary.

A. P. W. Paper Co., Broadway, Albany, N. Y., has awarded general contract to H. K. Ferguson Co., Cleveland, for new plant unit near North Barge Canal Terminal, to cost in excess of $900,000 with machinery. Contractor will prepare plans and act as engineer.

Board of Trustees, Westchester Joint Water Works No. 1, Mamaroneck, N. Y., is asking bids until April 6 for equipment for pumping station and filtration plant, including two Diesel engine generator units, each with capacity of 275 kw.; two high-lift and two low-lift centrifugal pumping units, motor-driven, and each with capacity of 3,000,000 gal. per day; mechanical mixing tanks; switchboard; wash water pumps, air compressors, mechanical equipment for chemical feed apparatus, etc., for a filter plant. Alexander Potter, 50 Church Street, New York, and Robert H. Stevens, Larchmont, N. Y., are associate engineers.

Huschle Brothers, Anable Avenue and Creek Street, Long Island City, Anthony J. Huschle, head, manufacturer of paper boxes and containers, has awarded general contract to Ettinger Security Construction Co., 50 Court Street, Brooklyn, for a new three-story plant on Thirty-seventh Street, Long Island City, to cost about $130,000, with equipment. Frank S. Parker, 119 West Fifty-seventh Street, New York, is architect.

Rainbow Light, Inc., Thirteenth Street, Long Island City, manufacturer of luminous lighting tubes, has arranged for establishment of nine operating plants at Long Island City, Philadelphia, Pittsburgh, Detroit, Cleveland, Chicago, Kansas City, Mo., New Orleans, and Atlanta Ga., and will develop these units for a maximum output of 300,000 ft. per month. E. C. Bull, formerly head of Hahn Motor Co., has become president and general manager.

Robinson Brothers Buffalo Ammonia Co., Montrose and Seneca Avenues, Brooklyn, is having plans drawn for a new one-story plant, 70 x 200 ft., to cost upward of $80,000 with equipment. H. C. Bracker, 2424 Myrtle Avenue, is architect.

Perth Amboy Airplanes Corporation, 218 Smith Street, Perth Amboy, N. J., Thomas L. Hanson, representative, has been formed with capital of $500,000 and 15,000 shares common stock, no par value, to succeed to Huff Airplanes, Inc., recently in financial difficulties. New organization will proceed with construction of plant, started by Huff Company, on portion of tract of Pardee Steel Corporation, to be one story, 190 x 260 ft., to cost about $75,000 with equipment. A number of buildings formerly used by steel company will be utilized for aircraft works.

Guarantee Finding Co., Inc., Orchard and Kinney Streets, Newark, jewelry manufacturer, has purchased one-story factory, 50 x 100 ft., at 145-47 Jackson Street, and will occupy for a new plant.

Myers, Bigelow & Shanley, 24 Walnut Street, Newark, architects, have completed plans for a two-story automobile

service, repair and garage building, to cost about $180,000 with equipment.

Board of Education, Paterson, N. J., is considering an addition to its vocational school at Ellison and Summer Streets, to cost about $115,000 with equipment.

Art Metal Works, 7 Mulberry Street, Newark, has engaged Henry Baechlin, 665 Broad Street, architect, to prepare plans for an addition, to cost more than $40,000 with equipment.

Gibraltar Tire & Rubber Corporation, 4912 Hudson Boulevard, West New York, N. J., is considering rebuilding portion of plant destroyed by fire March 21, with loss estimated at more than $80,000 with machinery. Charles Cholerton is president.

Board of Education, Essex County Vocational Schools, Hall of Records, Newark, is asking bids until April 4, for equipment and supplies for schools, including steel and iron, machine tools, hand tools; machine, sheet metal, automobile mechanical, electrical and wood-working supplies; steel lockers, etc. Robert O. Beebe is director.

Benjamin Hacker, since 1919 engaged in marketing automotive products for export and export manager for William & Harvey Rowland, Inc., Frankford, Philadelphia, and other companies, has removed to larger offices at 280 Broadway, New York. A display room has been opened for products he represents.

Worthington Pump & Machinery Corporation, New York, on April 1 will remove its executive offices and its export and New York district sales departments to 2 Park Avenue. General sales and advertising departments of corporation were recently moved to Harrison plant at 421 Worthington Avenue, Harrison, N. J.

New England

BOSTON, March 26.

REPORTS of inactivity still come from New England machine tool dealers. Sales, in practically all cases, are for single machines of minor importance. Orders by a majority of houses this month will probably fall below those of January and February, and the last three months of 1927. Business by dealers in used tools is hindered by auctions of surplus machinery or of companies going out of business. Sales the past week included a new speed lathe to a Connecticut shop, and motor-driven pedestal grinder with a 7-in. wheel to a Connecticut plant, a new high-speed hammer to a Rhode Island shop, fairly large used press to a Massachusetts company, two Bliss presses to a Springfield metal worker, 16-in. used lathe to a Maine machine shop, and a two-spindle drill to a New Hampshire plant.

The metal-working equipment of the H. & S. Tool Co., Brockton, Mass., was sold at auction March 22.

Some New England railroads are inquiring for fairly expensive single tools; otherwise no new inquiries of importance have developed. Sales of small tools have fallen off.

Cement mill, at Thomaston, Me., of Lawrence Portland Cement Co., with annual capacity of 1,000,000 bbl., has started preliminary operations and will begin production of cement next month. Its annual wages are estimated at $500,000, and consumption of raw materials, products and supplies, under normal conditions, will cost approximately $700,000. In addition, company operates a lime plant at Thomaston with a 25,000-ton annual capacity. Home office of Lawrence Portland Cement Co. is at Northampton, Pa. Company has under consideration plans for another cement works north of Bath, Me., but nothing definite has been decided.

Foundations are in for a three-story addition, 20 x 52 ft. for Specialty Products Co., 15 Gordon Avenue, Providence, R. I. Plans are private.

Leslie Weir, 41 East Forty-second Street, New York, architect, has closed bids on two one-story ice plants, 89 x 122 ft., and 77 x 87 ft., respectively, at Cambridge for Boston Ice Co., 110 State Street, Boston.

Stark Tool Co., Inc., 416 to 424 Moody Street, Waltham, Mass., contemplates building a one and one-half-story, 30 x 80 ft., addition. Plans are private.

Work will start at once on a one-story, 60 x 170 ft., sales and service station at 1172 Commonwealth Avenue, Boston, for Boston Buick Co. Mechanical equipment will be required. Edward B. Stratton, 25 Arch Street, Boston, is architect.

Oxford Paper Co., 200 Fifth Avenue, New York, will build an addition to its plant at Rumford, Me., to cost, with grinding and other equipment $125,000. Percy Searle, Rumford, company engineer, has plans.

North Shore Ice Delivery Co., 46 Lake Avenue, Lynn, Mass., has plans for a one-story, 100 x 175 ft. ice plant to cost, with equipment, $200,000. Funk & Wilcox, 26 Pemberton Square, Boston, are architects.

Bentley & Holmgren, 406 Court Exchange Building, Bridgeport, Conn., have been appointed representatives in Connecticut and western Massachustts for Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago.

Bids will be received by Board of Water Commissioners, Marshfield, Mass., for two duplicate pumping units, 10 x 12 in., vertical triplex, deep-well type, and 50-hp. Diesel engine, with accessories, for municipal waterworks. Symonds & Stevens, 70 State Street, Boston, are engineers.

Public Service Co. of New Hampshire, Manchester, N. H., has applied for permission to dispose of preferred stock to an amount of about $480,000, a portion of proceeds to be used for extensions and betterments in power plants and system, including transmission lines. Expansion and improvements planned prior to Sept. 1 are estimated to cost $700,000.

Edison Electric Illuminating Co., 39 Boylston Street, Boston, has approved plans for a new steam-operated power plant and switching station at Weymouth, Mass., to cost in excess of $1,000,000. Stone & Webster, Inc., 49 Federal Street, is engineer.

A. C. Gilbert Co., New Haven, Conn., manufacturer of electric fans and other electrical appliances, metal toys, etc., is arranging for sale of a preferred stock issue of 25,000 shares, portion of proceeds to be used for expansion.

Townsend Motor Car Co., Derby Street, Salem, Mass., has plans for a one-story addition to service and repair department, to cost $60,000 with equipment. G. H. Fanning, 221 Essex Street, is architect.

New England Metal Culvert Co., Palmer, Mass., has awarded general contract to J. Gascoigne & Co., Inc., 6 Beacon Street, Boston, for a new one-story plant, 80 x 90 ft., at South Boston. Monks & Johnson, 99 Chauncy Street, Boston, are architects and engineers.

Boston & Albany Railroad Co., South Station, Boston, has work under way on a new boiler plant at its shops at West Springfield, Mass., to cost about $400,000 with equipment. A mechanical coal and ash-handling system will be installed, and other automatic machinery. Dinsmore, McClear & Robbins, Springfield, Mass., are architects.

Lynn Gas & Electric Co., Lynn, Mass., has plans for a new steam power house, to cost about $225,000 with equipment. Stone & Webster, Inc., 49 Federal Street, Boston, is engineer.

City Ice & Fuel Co., Cleveland, has been awarded contract for refrigeration plant in Boston for Boston & Maine Railroad, to have a daily capacity of 200 to 300 tons. Cleveland company will also install a refrigeration system for a coliseum to be built in connection with that railroad's North Station.

Gulf States

BIRMINGHAM, March 26.

PLANS are being arranged by Crystal Oil Refining Corporation, Shreveport, La., for a new refinery at Monahans, Tex., with initial capacity of 5000 bbl. per day, to cost approximately $400,000 with equipment.

Continental Roofing and Mfg. Co., Tacoma Street, Mobile, Ala., has acquired property in Murrell district and is reported planning a new factory, to cost more than $45,000 with equipment.

Godfrey L. Cabot, Inc., Old South Building, Boston, has plans for a carbon black plant near Pampa, Tex., with air compressors and power equipment, to cost in excess of $350,000.

John E. Mitchell Co., 600 South Sixth Street, St. Louis, manufacturer of cotton ginning and flour milling machinery, has begun erection of new two-story plant, 100 x 200 ft., at Dallas, Tex., to cost approximately $50,000. A portion of equipment will be transferred from St. Louis plant and additional machinery provided.

Linde Air Products Co., 30 East Forty-second Street, New York, operated by Union Carbide & Carbon Co., same address, manufacturer of welding apparatus, etc., is reported planning erection of new plant at San Antonio, Tex., to cost about $50,000 with equipment. Prest-O-Lite Co., Inc., manufacturer of acetylene equipment, an affiliated organization, same headquarters, is said to be arranging for plant on adjoining site to cost close to like amount.

South Texas Gas Co., Laredo, Tex., is planning an expansion program, including construction of gasoline refinery, pipe lines, etc. A bond issue of $2,000,000 is being sold, a portion of proceeds to be used for work.

Standard Building Material Co., 2700 North Seventh Street, Birmingham, has asked bids on general contract for a new two-story storage and distributing plant, 60 x 122 ft., to cost about $35,000 with equipment.

Thompson Can Co., Dallas, Tex., has work under way on a new one-story tin can manufacturing plant at 1304-8 South Austin Street, totaling about 16,000 sq. ft. of floor space, to cost close to $40,000 with equipment.

Pasotex Petroleum Co., a subsidiary of Standard Oil Co. of California, 225 Bush Street, San Francisco, is completing plans for a 200-mile pipe line from El Paso to west Texas oilfield district, to cost more than $2,500,000. Work will be carried out in conjunction with proposed oil refinery at El Paso, Tex., to cost upward of $450,000 with equipment.

Vacherie Sugar Refinery, Jeanerette, La., will rebuild portion of cane sugar refinery recently destroyed by fire, with loss reported at close to $100,000 with equipment,

Atchison, Topeka & Santa Fe Railroad Co., 80 East Jackson Boulevard, Chicago, has awarded general contract to H. D. McCoy, Cleburne, Tex., for additional machine and repair shops at Cleburne, to cost more than $100,000 including equipment. Frank Merritt is chief engineer at Galveston, Tex.

E. L. Smith Oil Co., Mexia, Tex., has arranged for increase in capital from $5,000,000 to $10,000,000, a portion of fund to be used for extensions and betterments in oil refining and distributing plants, including acquisition of additional properties. Company has recently taken over properties of J. K. Hughes Development Co., in this district.

Exide Battery Co., Fifth and Lavaca Streets, Austin, Tex., has leased a one-story building, 70 x 130 ft., to be erected for a new service and repair works, to cost about $40,000 with equipment.

Ovens, power equipment, conveying and other machinery will be installed in one and two-story baking plant, 150 x 175 ft., to be erected by C. J. Patterson Corporation, 4050 Penn Street, Kansas City, Mo., at Houston, Tex., to cost upward of $200,000 with machinery.

Texas Utilities Co., Slaton, Tex., has authorized construction of transmission lines from Slaton to Tahoka, Tex., by way of Wilson, with power sub-stations at last-noted places, to cost about $50,000.

Philadelphia

PHILADELPHIA, March 26.

PLANS are being completed for a one-story motor bus service, repair and terminal building for Philadelphia Rapid Transit Co., Broad and Locust Streets, Philadelphia, to cost approximately $1,000,000 with equipment. Company engineering department is in charge.

Board of Public Education, Keystone Building, Nineteenth Street, Philadelphia, is asking bids until April 3 for boilers, electrical equipment, air filter, copper screens, etc., for school on Belgrade Street. William Dick is secretary and business manager.

A. C. Bieber, 1520 Locust Street, Philadelphia, architect, has completed plans for a two-story automobile service, repair and garage building at Rosemont, Pa., to cost upward of $80,000 with equipment.

Richard L. DeCou Co., Philadelphia, has purchased at public auction structural steel and ornamental iron plant formerly conducted at Norristown, Pa., by Gehret Brothers, Inc. New owner will operate plant as in past.

Philadelphia Auto Body Works, Inc., Philadelphia, has leased the one-story building at 1405-7 Race Street for a new plant.

Trenton Potteries Co., North Clinton and Ott Streets, Trenton, N. J., manufacturer of sanitary ware, has awarded general contract to J. H. Morris & Co., 211 North Montgomery Street, for a one-story addition, 65 x 170 ft., with extension, 35 x 74 ft., to cost more than $75,000 with equipment. W. A. Klemann, First National Bank Building, is architect.

Lawson Aircraft Co., 1819 Broadway, New York, has arranged with city council, Trenton, N. J., to occupy a portion of municipal machine shop on Lewis Street, and will use as an assembling works.

Concrete Steel Co., Camden, N. J., has filed plans for two one-story shop additions.

American Electric Power Co., operated by American Gas & Electric Co., 30 Church Street, New York, will begin work on its steam-operated electric power plant at Pennsville, N. J. Initial unit will have a rated capacity of 114,000 kw., divided into three turbo-generating units, with boilers, condensers and auxiliary equipment. Entire plant will develop an output of 400,000 kw. A steel tower transmission will be built for service for Atlantic City Electric Co., Atlantic City, N. J., and Delaware Electric Power Co., Wilmington, Del., affiliated organizations. Entire project will cost more than $7,500,000. Stevens & Wood, Inc., 120 Broadway, New York, is engineer.

Reading Airplane Co., Reading, Pa., recently organized, contemplates operation of a local plant for manufacture of aircraft, including parts, assembling and repair works. Allen K. Owen, Reading, is treasurer; Joseph E. Logan, Reading, is also an official.

Great Atlantic & Pacific Tea Co., 150 Bay Street, Jersey City, N. J., will install ovens, power equipment, conveying machinery, etc., in a baking plant, with storage and distributing plant, at Altoona, Pa. A refrigerating plant will also be installed. Entire project will cost $375,000.

Scranton Electric Co., Scranton, Pa., has secured permission to take over and consolidate eight light and power companies in Carbondale, Clifford, Laflin, Newton, Ransom and Scott Townships. Plans are under way for expansion, including transmission line construction.

Pennsylvania Power & Light Co., Allentown, Pa., is arranging for an increase in indebtedness from $80,000,000 to $180,000,000, a portion of fund to be used for expansion. Work will soon begin on a 66,000-volt power line in Berwick district, with rebuilding of transmission lines to Wilkes-Barre and Drums, Pa.

Chicago

CHICAGO, March 26.

FROM the viewpoint of sales, March is rounding out a trifle better than February, which likewise led January, making the showing in the first three months of 1928 better than the corresponding period of 1927. Business in prospect is encouraging and dealers are of the belief that orders will be well sustained in April.

Allis-Chalmers Mfg. Co. has purchased about $15,000 worth of equipment for its newly acquired Monarch tractor plant at Springfield, Ill., and other items are pending. Nash Motors Co., Kenosha, Wis., bought 18 presses and the Stewart-Warner Speedometer Corporation, Chicago, has ordered similar equipment.

A 10 per cent advance on shapers was made effective March 15.

Commonwealth Edison Co., 72 West Adams Street, Chicago, will build a sub-station at 6136 South Crawford Avenue, and another at 262 North Harding Street each to cost $40,000.

Mechanical Mfg. Co., Union Stock Yards, will build a two-story addition, 20 x 80 ft. H. H. Talsekamp is architect.

Chicago Bridge & Iron Works, 1305 West 105th Street, will build an addition, 100 x 200 ft., to cost $20,000.

Peoples Gas Light & Coke Co., 222 South Michigan Avenue, Chicago, will build a gas purifier to cost $170,000. Western Gas Construction Co., Fort Wayne, Ind., is general contractor.

Plant of Midwest Engineering & Equipment Co., 617 West Fulton Street, Chicago, recently was damaged by fire to the extent of $20,000.

Hitchcock & Tinker, Inc., 330 United States National Bank Building, Denver, Colo., contractor which recently completed building Moffat Tunnel, has formed Hitchcock & Tinker Equipment Co., to handle sale of entire machinery, camp equipment and supplies used in building tunnel.

Vergan Schmidt Co., engineer and manufacturer, formerly at Champaign, Ill., has acquired a new plant and additional production facilities at Dubuque, Iowa, and removed to that city.

Ornamental Brass Shops, Tenth Street and Tenth Avenue, Rockford, Ill., will soon start construction of an addition containing 17,000 sq. ft. to provide for expansion. Company manufactures furniture, phonograph hardware, brass and aluminum casting, punch press products and ornamental iron.

S. G. Taylor Chain Co., Chicago, has removed its general sales offices to Hammond, Ind. Chicago sales office will remain at 140 South Dearborn Street.

Healy-Ruff Co., 765 Hampden Avenue, St. Paul, Minn., has been organized to manufacture radiator hangers and concrete inserts. Hangers are made of gray iron castings and steel and inserts entirely of castings.

Plans are being arranged by Dextex Watch Clock corporation, 4147 East Ravenswood Avenue, Chicago, for rebuilding portion of four-story plant recently destroyed by fire, with loss of $32,000.

Hudson Metal Products Co., 120 North Green Street, Chicago, manufacturer of machine screw products, has acquired one-story building, 60 x 125 ft., at 4500-6 West

The Crane Market

FRESH inquiry for overhead cranes has been small, but the locomotive crane field is quite active. The Chicago district has been considerably more active than in the East. Inquiries for locomotive cranes include some railroad business. Dwight P. Robinson & Co., New York, are asking for prices on several locomotive cranes. The Franklin Lumber Co., Newark, N. J., in the market for two 15-ton lumber handling cranes and several electric hoists, is not expected to purchase much before May. Rockford Drop Forge Co., Rockford, Ill., will buy two 5-ton floor operated electric cranes.

Among recent purchases are:

F. L. Smidth & Co., 50 Church Street, New York, 25-ton, 1-motor overhead crane from Whiting Corporation.

National Sanitary Mfg. Co., Salem, Ohio, one 5-ton, 58-ft. span crane from Alliance Machine Co.

Augusta Street, for a new plant. Additional facilities will be provided for enlarged output.

Western States Public Utilities Co., Terminal Building, Omaha, Neb., has approved plans for a new one and two-story power house at Sheldon, Iowa, to cost close to $250,000 with transmission lines.

Central Illinois Public Service Co., Springfield, Ill., will build a new ice manufacturing plant at Bluford, Ill., to cost approximately $100,000 with machinery. Murray Hanes, 205 South Sixth Street, Springfield, is architect.

Iowa Soap Co., Valley Street, Burlington, Iowa, will install a power plant in connection with factory addition. Entire project will cost about $110,000. Federal Engineering Co., Central Office Building, Davenport, Iowa, is architect and engineer.

Southern Colorado Power Co., Pueblo, Colo., plans extensions and improvements in power house at Lamar, Colo., with installation of additional equipment. Plant was recently acquired from city. Transmission lines in that section will also be built.

Chicago Solder Co., 4201 Wrightwood Avenue, Chicago, Ill., has work in progress on a two-story building, totaling about 19,000 sq. ft. floor space, as a second plant unit. It will cost about $80,000. Schmidt, Garden & Erikson, 104 South Michigan Boulevard, are architects.

Fox & Fox, 38 South Dearborn Street, Chicago, architects, have plans for a five-story automobile service, repair and garage building, 80 x 145 ft., to cost in excess of $450,000 with equipment.

Otter Tail Power Co., Fergus Falls, Minn., has authorized plans for extensions and improvements in steam-operated power house at Jamestown, N. D., including installation of boilers, stokers and auxiliary equipment. Betterments will also be made at hydroelectric power plant at Dayton Hollow, near Fargo, N. D., to include installation of set of horizontal waterwheels, generating equipment, exciters and auxiliary apparatus.

C. B. Isett & Son, 1701 Winnebago Avenue, Chicago, manufacturer of boilers and other plate products, have acquired two-story plant, 50 x 100 ft., at 3035-37 North Rockwell Street, for a new works.

A. P. DeVore, 810 Palmer Avenue, Pueblo, Colo., is at head of a project to construct and operate a local plant for manufacture of airplanes and parts, to cost about $45,000. Site is being secured.

Mall Tool Co., 7740 South Chicago Avenue, Chicago, has authorized plans for a one and two-story addition to cost approximately $30,000. Buckley & Skidmore, First Trust & Savings Bank Building, Hammond, Ind., are architects.

Common Council, Mott, N. D., will take bids late in April for equipment for municipal waterworks, including electric-pumping machinery, elevated water tank and steel tower, etc., to cost $55,000. E. R. Griffin is engineer.

Buffalo

BUFFALO, March 26.

PLANS are being drawn for a one-story addition, 40 x 180 ft., to factory of S. B. Whistler & Sons, Inc., 1459 Niagara Street, Buffalo, manufacturer of tools, dies, etc., to cost close to $25,000. Nathan Sturdy and Harry A. Wander, Prudential Building, are engineer and architect respectively.

Board of Education, Syracuse, N. Y., is considering installation of manual training equipment in addition to central high school to cost $275,000. Nelson F. Pitts, Jr., City Hall, is city engineer, in charge of plans. G. Carl Alverson, Educational Building, is superintendent.

Board of Works, Lockport, N. Y., will install pumping machinery, air compressors, mechanical equipment for chemical feed machinery, meters, regulators, etc., in connection with a filtration plant for municipal waterworks to cost $550,000. J. N. Chester Engineers, Inc., Union Bank Building, Pittsburgh, is engineer.

Fairbanks Co., Binghamton, N. Y., manufacturer of valves and kindred equipment, will rebuild main unit of local plant destroyed by fire March 21, with loss close to $150,000 including equipment. Headquarters are at Broome and Lafayette Streets, New York.

Board of Education, Binghamton, N. Y., contemplates installation of manual training equipment in new junior high school to cost about $650,000. Edward W. Prentice, City Hall, is city engineer, in charge.

Buffalo, Niagara & Eastern Power Corporation, Buffalo, is arranging for a preferred stock issue to total 500,000 shares of stock, a portion of proceeds to be used for extensions and improvements, including transmission line construction, and to complete merger with Niagara Falls Power Co., Niagara Falls, N. Y., and other power utilities in this section.

Penn Yan Union High School District, Penn Yan, N. Y., plans installation of manual training equipment in new junior high school to cost about $250,000. J. Johnson, president, is in charge.

Common Council, North Elba, N. Y., Willis Wells, supervisor, is arranging fund of $75,000 for a municipal airport in Plain Farms district, to include hangar, machine and repair shop, oil storage and distributing plant.

J. C. Harding & Son, Oswego, N. Y., have been awarded contract for rebuilding plant of Oswego Boiler Co., Oswego, recently destroyed by fire.

Pittsburgh

PITTSBURGH, March 26.

MACHINE tool business is of only moderate volume. Inquiries are fairly constant and sales are frequent, but usually are for single tools.

Plans are being drawn by Mine Safety Appliance Co., Braddock and Thomas Avenues, Pittsburgh, manufacturer of coal-mining equipment and apparatus, for a three-story addition, to cost upward of $150,000 with equipment, Bernard H. Prack, Martin Building, is architect and engineer.

Pittsburg Water Heater Co., Jenkins Building, Pittsburgh, with main plant at Crafton, Pa., has arranged for purchase of nine acres of factory property at Herrs Island, vicinity of Charles Street, with building, for $580,000, and will remodel for a new plant unit. Company is reported to be planning acquisition of other property in Northside district in connection with expansion program, for which a fund of $1,200,000 recently was arranged.

Mayer Body Corporation, 6461 Frankstown Avenue, Pittsburgh, manufacturer of automobile bodies, has awarded general contract to Conley & Demey, 127 North Highland Avenue, for a one-story addition.

Ovens, power equipment, conveying and other machinery will be installed in new two and three-story plant, 90 x 250 ft., to be erected by Grennan Bakeries, Inc., 6016 Rodman Street, Pittsburgh, to cost more than $125,000, for which bids have been asked on general contract.

Appalachian Electric Power Co., Bluefield, W. Va., is said to be planning construction of a new power substation in Williamson district, to cost $135,000 with equipment.

United States Engineer, Keenan Building, Pittsburgh, is asking bids until April 19, for lock-operating machinery for Lock No. 6, Allegheny River.

Board of Education of Cumberland Township, Carmichael, Pa., is planning installation of manual training equipment in a new high school to cost $250,000. C. C. Compton, Fourth Street and Thompson Avenue, Donora, Pa., is architect.

City Council, Pittsburgh, is considering an appropriation of $30,000 for purchase of special machinery and trucks for bureau of street-cleaning, including two flushers and two graders.

Board of Education, Martinsburg, W. Va., is considering installation of manual training equipment in new high school to cost $270,000, for which bids have been asked on general contract until April 16. Frampton & Bowers, 412 Eleventh Street, Huntington, W. Va., are architects.

Pennsylvania-Ohio Power Co., Youngstown, Ohio plans construction of steel tower transmission line over Mahoning River, near Mahoningtown, Pa.

Pittsburgh-Des Moines Steel Co., on May 1 will occupy its new office building at its plant on Neville Island, Pa., and sales and engineering divisions now located in Professional Building, Pittsburgh, will be transferred to new building.

City Commissioners, Mannington, W. Va., are asking bids until April 24 for motor-driven pumps and air compressors for city waterworks.

Leonard R. Nourie, Park Building, Pittsburgh, has been appointed representative in Pittsburgh district for Barrett-Cravens Co., Chicago, manufacturer of lift trucks and portable elevators.

Cleveland

CLEVELAND, March 26.

MACHINE tool sales showed quite an increase the past week. Single orders were more plentiful than for some time and a few lots of three or four machines were placed. Business was scattered among automobile parts manufacturers and other industries. The call was largely for production machinery. The New York Central Railroad has allowed requistions for two or three machines for which inquiry was made several months ago and these are expected to be placed shortly. Business in the Detroit territory continues rather slow.

Cleveland Electric Tramrail Division of Cleveland Crane & Engineering Co., Wickliffe, Ohio, has appointed Leeds, Tozzer & Co., Inc., 75 West Street, New York, representative of its tramrail system in Manhattan, Bronx and Staten Island sections of New York.

Ludlow Window Ventilator Co., East Liverpool, Ohio, has been organized to manufacture special type of window ventilator. Plant has been completed, equipment installed and company is now assembling special dies and presses. Materials used will include copper screen wire, bolts and nuts, sheet iron, screws, brass brads, filter cloth and white pine lumber.

Peerless Malleable Castings Co., Toledo, Ohio, organized about a year ago to take over local malleable iron foundry of United Malleable Iron Co., has discontinued operations and business will be liquidated.

Detroit Range Boiler & Steel Barrel Co., recently at 375 Phillips Avenue, Toledo, Ohio, has removed to 454 Earl Street, that city.

Toledo Safety Device Co., 141 North Erie Street, Toledo, has been organized to manufacture mechanical safety devices and fire alarm systems. Company does not contemplate building plant at present and work will be done by contract.

William Hamilton Sons Car Co., Newark, Ohio, successor to Jewett Car Co., will be sold at public auction April 10 and 11, as result of liquidation proceedings. Company went into receivership Nov. 1, 1927. Sale will include plant, land and buildings, machinery, equipment, tools, dies, etc.

Plans are being drawn by Scott & Fetzer Co., 11401 Locust Avenue, Cleveland, manufacturer of vacuum cleaners, parts, etc., for a two-story addition, 43 x 60 ft., to cost about $45,000 with equipment. A. G. Wolf, Swetland Building, is architect.

Steel Improvement & Forge Co., 5003 Windsor Street, Cleveland, has awarded general contract to J. L. Hunting, Guarantee Title Building, for a one-story plant at 940-50 Addison Road, 60 x 200 ft., to cost close to $90,000 with equipment.

Air-Way Electric Appliance Corporation, Toledo, is disposing of a preferred stock issue to total $387,900, a portion of proceeds to be used for enlargements and additional equipment.

National Sanitary Co., Salem, Ohio, manufacturer of sanitary ware, has awarded a general contract to Boyd-Meinhart Construction Co., Massillon, Ohio, for a new one-story plant to replace a factory recently destroyed by fire. It will cost approximately $100,000 with equipment.

Midwest Rubber Reclaiming Co., recently formed as an interest of Akron Rubber Reclaiming Co., Barberton, Ohio, S. G. Luther, manager latter company in charge, is asking bids on general contract for a new plant at East St. Louis, Ill., with main one-story unit, 90 x 500 ft., power house and other buildings, to cost close to $200,000 with machinery. Refining equipment, mechanical washers, motors and other power equipment will be installed.

Enameled Sanitary Co., Alliance, Ohio, has purchased local foundry of Buckeye Jack Co., on 35-acre tract and will remodel for a new plant.

G. Schaefer Wagon Co., 4180 Lorain Avenue, manufacturer of automobile bodies, wagons, etc., will soon begin rebuilding plant recently destroyed by fire, to be four stories and basement, and to cost $135,000 with equipment. W. S. Longee, Marshall Building, is architect.

St. Louis

ST. LOUIS, March 26.

WORK will begin by Stewart Inso Board Co., Lake Road, St. Joseph, Mo., manufacturer of wallboard, on three additions, comprising three-story rotary unit, 50 x 72 ft.; one-story main factory, 40 x 600 ft.; and one-story storage and distributing plant, 60 x 200 ft., to cost $200,000 with equipment. A. G. Gibson is company engineer, in charge.

General Tire & Rubber Co., Akron, Ohio, is completing plans for a three-story factory branch and distributing plant at Kansas City, Mo., to cost $210,000 with equipment. Greenbau, Hardy & Schumacher, Scarritt Building, Kansas City, are architects.

Kansas City Public Service Co., Kansas City, Mo., is disposing of a bond issue of $4,400,000, a portion of fund to be used for extensions and improvements in power plants and systems; approximately $2,500,000 will be used for 1928 program.

Carter Carburetor Co., 2838 North Spring Avenue, St. Louis, manufacturer of carburetors and kindred equipment, has awarded general contract to Fruin-Conlon Contracting Co., Merchants Laclede Building, for a two-story addition, 90 x 240 ft., to cost about $75,000 with machinery.

Common Council, Kennett, Mo., is said to have plans maturing for installation of a municipal electric light and power plant.

Kaysing Iron Works, 2525 Montgomery Street, St. Louis, has plans for a one-story addition, totaling about 30,000 sq. ft. floor space, to cost approximately $50,000.

Atchison, Topeka & Santa Fe Railway Co., 80 East Jackson Boulevard, Chicago, has awarded general contract to H. W. Underhill Construction Co., Wichita, Kan., for a one-story machine and boiler shop, 42 x 150 ft., at Guthrie, Okla., to cost about $50,000 with equipment. E. A. Harrison is company architect.

Missouri Farmers' Association, Virginia Building, Columbia, Mo., has plans for a one-story cold storage and refrigerating plant at Willows Springs, Mo., to cost about $40,000 with equipment. F. M. Scott is secretary.

Pillsbury Flour Mills Co., Minneapolis, Minn., is considering a new flour mill and grain elevator on site, 300 x 1300 ft., at Enid, Okla., to cost more than $850,000 with machinery.

Board of Trustees, Wichita Municipal University, Wichita, Kan., has authorized plans for a steam power plant to cost about $50,000 with equipment. Edward Forsblom, Sedgwick Building, is architect.

City Council, Marshall, Mo., has secured a fund of $80,000 for extensions and improvements in municipal electric light and power plant, including installation of generating, boiler and other equipment.

Simmons Bed Co., Kenosha, Wis., has awarded general contract to Peter Kiewit's Sons, Omaha National Bank Building, Omaha, Neb., for a one-story factory branch and distributing plant at Omaha, to cost close to $40,000.

Board of Education, Wellington, Kan., plans installation of manual training equipment in new two-story high school, to cost $250,000, for which bids have been asked on general contract. Schmidt, Boucher & Overend, Fourth National Bank Building, Wichita, Kan., are architects.

South Atlantic States

BALTIMORE, March 26.

PLANS are being completed by Chesapeake Paper Board Co., Key Highway and Baltimore & Ohio Railroad, Baltimore, for four new plant units, to cost more than $100,000 with equipment. Karl A. Lefern, 171 Madison Avenue, New York, is architect and engineer.

J. W. Geddes, 1523 L Street, N. W., Washington, architect, will soon ask bids on general contract for five-story automobile service, repair and garage building, to cost $185,000 with equipment.

Carolina Power & Light Co., Raleigh, N. C., plans construction of new transmission line from Canton to Asheville, N. C., and from Canton to Greenville, S. C. about 70 miles, to operate at 110,000 volts, to cost more than $200,000.

Quartermaster Department, United States Army, Third Corps Area, Baltimore, will receive bids until April 13, for a deep-well pump with accessories for installation at Fort Hunt, Va., circular 15.

A. A. Roudabush, Shenandoah, Va., formerly head of Page Power Co., operating in Page County, Va., is interested in a new power enterprise to include construction of a power dam and hydroelectric generating plant on Shenandoah River, about one mile from Shenandoah, to cost more than $750,000 with transmission lines. It is purposed to organize a company to carry out project.

American Commonwealths Power Corporation, operating Savannah Gas Co., Savannah, Ga., and other light and power properties in Missouri, Arkansas, Kansas and Texas, is disposing of a preferred stock issue to total $4,750,000, a portion of proceeds to be used for extensions and improvements, including purchase of additional properties.

Board of Awards, office of city register, Baltimore, has awarded a general contract to B. H. B. Ennis, 1933 East Thirty-first Street, for a three-story and basement municipal repair and reconditioning shop, with equipment storage and distributing department, to cost $130,000. Structure will be used by Board of Education.

Isaac Andrews, president, Andrews Loom & Harness Co., Spartanburg, S. C., is reported planning a new plant for the manufacture of textile looms and other textile mill equipment, to cost more than $150,000 with machinery.

Eastern Shore Gas & Electric Co., Salisbury, Md., is negotiating for purchase of municipal electric light and power plant at Centerville, Md., for $160,000, and plans extensions and improvements, including transmission line construction.

Atlanta Textile Supply Co., Austell Building, Atlanta, Ga., manufacturer of cotton mill equipment and supplies, is said to be planning erection of new factory, to cost about $35,000 with machinery.

C. F. Palmer, head of Palmer, Inc., Palmer Building, Atlanta, Ga., has plans for a multi-story automobile service, repair and garage building, to cost about $250,000 with equipment.

Virginia Electric & Power Co., Richmond, Va., is arranging for bond issue of $8,000,000, a portion of fund to be used for extensions and betterments in plants and transmission lines.

Cincinnati

CINCINNATI, March 26.

MARCH is closing with a notable lack of uniformity in sales of local machine tool companies. A number of builders report that orders have declined sharply in the past 30 days, but, on the other hand, there is an equally important group which has had good business. In at least one case a large manufacturer states that bookings in March have been the best, with one exception, of any month since 1919.

Preliminary review of activities in the first quarter of this year shows that considerable unevenness has existed in both sales and production. Some companies have increased orders about 50 per cent over the same period of 1927, while several builders have been disappointed at the small amount of business received. In general, however, sales have averaged close to 25 per cent ahead of first quarter last year. One of the healthiest signs has been that most of the business has come from the general industrial field. Automobile makers have bought a fair amount of equipment, but have confined purchases to a comparatively small number of builders. Orders placed by railroads have been extremely light.

The outlook for the next three months is considered good by the majority of machine tool companies, all of which have a large volume of pending inquiries. Particularly in the automobile industry is the prospect bright for buying considerable equipment.

Outstanding among transactions the past week have been the sale of about $100,000 worth of special lathes to a company in the Detroit district and the receipt by a local builder of an order for approximately $40,000 worth of machines from Germany.

Air Corps, Material Division, Wright Field, Dayton, Ohio, will receive bids until April 20, for aircraft parts, including windshield assemblies, control assemblies, pulleys, lever assemblies, tube assemblies, wiring plates, hinges, radiators, etc., circular 28283.

Phillips & Buttorff Mfg. Co., Fourteenth Avenue and Hamilton Street, Nashville, Tenn., manufacturer of stoves, ranges, etc., plans a two-story addition to cost about $45,000. Madison P. Jones, 336 Chesterfield Avenue, is architect.

R. R. Ogilvie, American Trust Building, Nashville, Tenn., has filed plans for a three-story automobile service, repair and garage building, to cost close to $85,000 with equipment.

City Council, Knoxville, Tenn., has approved plans for a one-story municipal service, repair and garage building, 50 x 300 ft., to cost approximately $100,000 with equipment. L. M. Dow, Brownlow Building, is achitect.

City Transit Department, Cincinnati, has plans for installation of 19 automatic power substations for street railroad system, to cost more than $500,000 with equipment. Power will be secured from Union Gas & Electric Co., which is interested in project.

Glasgow Oil Refining Co., Glasgow, Ky., is said to have plans under advisement for rebuilding portion of plant recently destroyed by fire with loss of about $35,000 including equipment.

Union Carbide & Carbon Corporation, 30 East Forty-second Street, New York, is said to be completing plans for a new one-story plant in Hollywood section, Memphis, Tenn., to cost about $60,000. An adjoining tract will be used for a plant by Prest-O-Lite Co., a subsidiary, for manufacture of acetylene equipment, etc., to cost close to like sum.

City Council, Paducah, Ky., is considering construction of a municipal electric light and power plant, to cost more than $45,000 with machinery. Surveys have been authorized.

Board of Education, Nashville, Tenn., is considering installation of manual training equipment in proposed new two-story and basement high school on Park Avenue, to cost in excess of $250,000, for which superstructure will soon begin. Ausmus & Clark, Nashville Trust Building, are architects.

Detroit

DETROIT, March 26.

BIDS will soon be asked by Chevrolet Motor Car Co., Holbrook Avenue, Detroit, for a one-story addition to be used as a gear and axle works, to cost more than $90,000. Albert Kahn, Inc., Marquette Building, is architect and engineer.

Consumers Power Co., Jackson, Mich., has plans nearing completion for an addition to its steam-operated electric generating plant, Grand Rapids, Mich., with installation of turbo-generating unit and auxiliary equipment to double present capacity, totaling about 55,000 hp. Following completion of this work other expansion will be carried out to more than triple capacity. Extensions will be made in transmission lines. Entire project will cost more than $1,000,000. Charles W. Tippy is vice-president and general manager.

Huron Forge & Machine Co., 9041 Alpine Avenue, Detroit, is planning installation of additional equipment in its machine shop.

Board of Education, Pontiac, Mich., will soon take bids for a two-story manual arts school on Central High School campus, to cost $100,000. Childs & Smith, 720 North Michigan Avenue, Chicago, are architects.

Frank F. Taylor Co., Inc., 2801 Highland Avenue, Norwood, Cincinnati, manufacturer of automobile wheels, juvenile vehicles, etc., has purchased Central Wheel Co., Muskegon, Mich., and will consolidate with its organization. Equipment will be removed to Cincinnati works which will be extended to accommodate increase.

L. A. Young Spring & Wire Corporation, 9200 Russell Street, Detroit, manufacturer of special springs and other wire goods, is disposing of preferred stock issue to total $2,550,000, a portion of fund to be used for expansion.

New interests headed by F. C. Bowers and A. J. Jennings are completing arrangements for purchase of controlling interest in Farmer Lubrication Systems, Inc., 2633 Sixteenth Street, Detroit, manufacturer of lubricating devices and equipment, and will carry out an improvement and development program. A new company will be formed with capital of $375,000 to take over property.

Board of Education, Lincoln Park, Mich., plans installation of manual training equipment in new three-story high and grade school to cost about $900,000, for which plans will be prepared by Verner, Wilhelm & Molby, Book Building, Detroit, architects.

Karp Brothers Coal & Ice Co., 3900 Orleans Street, Detroit, has awarded general contract to Zacks & Lerner, Broadway Exchange Building, for a one-story ice-manufacturing plant, 50 x 175 ft., to cost approximately $100,000 including equipment.

Buick Motor Car Co., Flint, Mich., has acquired property at West Sixty-fifth Street and LaVergne Avenue, Chicago, and plans early erection of one-story factory branch, parts and distributing plant, totaling 240,000 sq. ft. floor space, to cost about $650,000 with equipment. Factory branch at Calumet Avenue and Twenty-first Street, Chicago, will be transferred to new location.

Brown Instrument Co., Philadelphia, maker of recording instruments, has removed its Detroit branch to larger quarters at 576 Maccabee Building. R. W. Mayer is district manager.

Milwaukee

MILWAUKEE, March 26.

A MODERATE run of orders is being booked by local machine-tool manufacturers. Sources of new business cover a wide range of industries, and while individual bookings usually represent only one or two items, the aggregate is relatively satisfactory. Purchasers as a rule request quick delivery. Automotive and farm machinery plants are probably the best buyers and most active in putting forth inquiries. The tool market as a whole exhibits less of the dragging tendency and while activity is uneven, improvement is discernible.

Follen-Lorenz Tool Co., Kenosha, Wis., has acquired plant of former Marwin Motor Truck Co., with 35,000-sq. ft. of floor area, and is expanding output and character of product. It manufactures tools, dies, special tools, bank and postal cancelling machines, and in new plant will also manufacture metal stampings and do deep drawn work, equipment for which is now being purchased. Firm title is being changed to Follen-Strom Mfg. Co. Carl Arthur Strom will join the company as vice-president and general sales manager about June 1. Fred Lorenz, while retaining an interest, has not been active in company's affairs for some time. James H. Follen is president-treasurer and general manager, and E. Mindermann, secretary.

Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., plans investment of $350,000 in a new digester plant designed by Childs & Smith, architects and engineers, Chicago. Work will begin April 1. Plant will be 60 x 180 ft., 90 ft. high, to house nine Mitscherlich process digesters. Biggs Boiler Works Co., Akron, Ohio, has contract for tanks. W. F. Thiele is chief engineer.

H. Barkow Co, 179 Milwaukee Street, Milwaukee, manufacturer of automobile bodies, truck bodies, cabs, etc., will replace its present factory with a new plant, 60 x 120 ft., two stories and part basement, at a cost of about $40,000. Construction work has been placed with H. Schmitt & Son, Inc., 14 Burleigh Street, local.

Johnsen Engine Devices Co., Milwaukee, has been organized by Peter Johnsen and associates to develop and promote use of a new injection system for Diesel engines which he recently designed and patented. New concern will specialize in marine engines but will also do work in converting tractor and industrial gasoline engines into oil-burning engines. J. Gilbert Hickcox and Arthur Kowarsch are associated with Mr. Johnsen. Offices have been opened at 110 East Wisconsin Avenue.

Indiana

INDIANAPOLIS, March 26.

BIDS will be asked soon for extensions and betterments in municipal electric light and power at Logansport, including installation of additional equipment. C. J. Horn, Citizens' Loan & Trust Building, is architect.

George J. Mayer Co., 36 South Meridian Street, Indianapolis, manufacturer of dies, stamps, etc., has awarded general contract to Brandt Brothers & Co., Indiana Trust Building, for a two-story addition, 50 x 150 ft., to cost about $25,000. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects.

Showers Brothers Co., Bloomington, manufacturer of kitchen cabinets, etc., has completed plans for a one-story addition, 78 x 100 ft., to cost approximately $50,000.

Board of Public Works, Evansville, will take bids early in April for a one-story municipal automobile repair, service and garage building, to cost about $45,000. Frank Schletter, 113 South Fourth Street, is architect.

United Public Utilities Co., Winchester, operating light, power and ice-manufacturing plants, is disposing of an issue of $3,750,000, part of the proceeds to be used for extensions and improvements, including transmission line construction.

Board of Education, Tell City, plans installation of manual training equipment in a new high school, to cost $200,000, for which bids will be asked on general contract early in April. Troutman & Kreisel, American Trust Building, Evansville, are architects.

North Indiana Public Service Co., Valparaiso, Ind., has approved plans for construction of a pipe line for gas supply between Valparaiso and Michigan City, Ind.

Board of Sanitary Commissioners, Indianapolis, is planning installation of a new turbine pumping unit for municipal sewage system, to replace an engine destroyed by explosion several months ago. A fund of $110,000 is being arranged for this and other sewage station work.

Case Electric Co., Marion, is erecting a factory, 137 x 140 ft., to replace structure destroyed by fire several weeks ago.

Finnell System, Inc., Elkhart, has taken over business of American Scrubbing Equipment Co., Hannibal, Mo., and removed plant to Elkhart. Company manufactures floor machinery, requiring sheet steel, malleable, gray iron and aluminum castings. Castings are machined, but not made in plant and pressed steel is produced.

Pacific Coast

SAN FRANCISCO, March 21.

CONTRACT has been let by E. H. Edwards Co., Butler Road, South San Francisco, manufacturer of wire rope, for a one-story addition, 60 x 720 ft., to cost about $80,000 with equipment. Engineering department of company is in charge.

R. M. Faliday, Los Angeles, has engaged J. Thomas Payne, Mutual Life Building, architect, to prepare plans for a one-story machine shop, 40 x 140 ft., to cost close to $20,000 with equipment.

Crane Co., 836 South Michigan Avenue, Chicago, has plans for a one and one-half story factory branch and distributing plant at Tucson, Ariz., to cost about $45,000 with equipment.

Wolfe & Higgins, Realty Building, San Jose, Cal., architects, have plans for a one and two-story machine shop for company whose name is temporarily withheld, to cost about $19,000 with equipment.

East Bay Iron & Metal Works, Oakland, Cal., has awarded general contract to Spivock & Spivock, Hobart Building, San Francisco, for rebuilding portion of plant at 2310 Peralta Street, to cost about $25,000. Charles Wagner, Hobart Building, is architect.

O. L. Cowan, San Bernardino, Cal., local representative for Lincoln and Ford automobiles, is having plans drawn for a new two-story automobile service, repair and garage building, 150 x 300 ft., to cost about $150,000 with equipment. John P. Perrine, Lincoln Building, Los Angeles, and Howard E. Jones, San Bernardino, are architects.

Salt Water Valley Water Users Association, Phoenix, Ariz., has plans for construction of hydroelectric power plant in Stewart Mountain district, with initial output of 8000 kw., to cost more than $250,000 with equipment. A transmission line will be built for connection with lines of Central Arizona Light & Power Co., which will use majority of output.

Federated Fruit & Vegetable Growers Association, Merced, Cal., is considering construction of new one-story cold storage and refrigerating plant to cost close to $50,000. E. W. Yeager and L. E. Arnold, are at head of organization.

Apple Growers Cold Storage Co., Watsonville, Cal., will soon take bids on general contract for one-story cold storage and refrigerating plant, 300 x 500 ft., to cost $240,000 with equipment. Uttley & Kleindinst, 354 Hobart Street, Oakland, Cal., are engineers.

Clyde Equipment Co., Portland, Ore., has been appointed distributer in Northwest for Jaeger Machine Co., Columbus, Ohio; C. S. Johnson Co., Champaign, Ill.; Milwaukee Gas Tool Corporation, Milwaukee; Alloy Steel & Metals Co., Los Angeles, and Bucyrus-Erie Co., Erie, Pa., and Milwaukee.

Canada

TORONTO, March 26.

THE general upward trend in industrial activities in the Dominion is reflected in more extensive buying of machinery and machine tools. The automotive industry continues to place orders and local builders and dealers are receiving considerable new business from this source. Both the Canadian National and Canadian Pacific railroads have been in the market of late for shop equipment and much other business is pending. The Canadian Pacific will purchase considerable equipment for replacement at shops at Brownville Junction, Me.; McAdam, N. B.; Newport, Vt.; Three Rivers, Que., and at Ottawa, Kingston, London, Windsor, Sudbury and Toronto. At Vankleek Hills, Buckskin and Ayr, Ont., water stations will be improved by the installation of electrically operated pumps.

Waltheimer Paint & Varnish Corporation, London, England, will establish a manufacturing plant at Toronto, Ont., to cost $500,000. R. Mellor, president and general manager, has been in Toronto and will refer plans to the board in London. He expects to return to Toronto in about six weeks when building operations will be started.

National Refractories, Ltd., has purchased land and buildings at Welland, Ont., formerly occupied by Niagara Appliances, Ltd., for establishment of a plant to manufacture fire brick, etc. Building will be razed to make

room for a modern manufacturing plant. H. I. Darby, Montreal, is general manager.

L. & N. Co., Ltd., St. Johns, Que., manufacturer of electrical conduits, plans erection of a $100,000 addition. Company is interested in purchase of machinery and tools.

Lorne Fire Engine Co., Ingersoll, Ont., has purchased a building at Mitchell, Ont., and will remove its business to that city.

Sully Brass Foundry, Ltd., which recently purchased Bigley Foundry on Wabash Avenue, Toronto, will spend $10,000 on improvements and installation of new machinery to use for an extension. Two machine shops on site have not been in operation for two years but will be reopened at once.

Andrew Malcolm Furniture Co., Listowel, Ont., is planning an addition to its factory. Details have not been completed, but is is understood that construction work will start this summer.

James Playfair and Associates, Midland, Ont., are having plans prepared by C. D. Howe & Co., Whalen Building, Port Arthur, Ont., for a 1,000,000-bu. reinforced concrete grain elevator at Toronto. Provision will be made for an additional 1,000,000-bu. storage. Construction work will start immediately.

Stephens-Adamson Mfg. Co. of Canada, Ltd., with plant at Belleville, Ont., Canadian subsidiary of Stephens-Adamson Mfg. Co., Aurora, Ill., maker of conveying, transmission and screening machinery, has established branch sales engineering offices in Bank of Hamilton Building, Toronto, in charge of A. F. White, and in New Birks Building, Montreal, in charge of George H. Smith.

MacLaren Co., Buckingham, Que., contemplates erection of a power development plant on Lievre River at High Falls, Que.

Durham Furniture Co., Durham, Ont., will add another story to its factory and will be in market for wood-working machinery, tools, etc. Construction work will start in summer.

Goodyear Cotton Co. of Canada, Ltd., Laframboise Street, St. Hyacinthe, Que., is planning erection of a four story factory, 200 ft. long, to cost $600,000.

Western Canada

International Clay Products, Ltd., plans erection of a factory at Estevan, Sask., to cost $75,000.

Reliance Motor & Machine Works, Ltd., 1039 Georgia Street West., Vancouver, B. C., has awarded contract to Dominion Construction Co., local, for construction of machine shop and garage to cost $35,000. Building will be one story and basement, 100x120 ft., of reinforced concrete construction.

Midland Pacific Terminals, Ltd., care of Harbor Board, Vancouver, B. C., plans construction of 500,000 bu. grain elevator at North Vancouver, to cost $300,000.

Cork Province Mines, Ltd., Vancouver, B. C., has awarded contract to Bartholomew, Montgomery & Co., engineers, for installation of a hydroelectric plant to cost $60,000. Company also proposes installation of additional machinery in milling plant.

Foreign

BIDS will be received by State Electricity Commission, Melbourne, Australia, until May 21 for 22,000-volt transformer equipment and spares. Specifications available at office of Bureau of Foreign and Domestic Commerce, Customhouse, New York, and 33 South Clark Street, Chicago.

Municipal Gas & Electric Corporation, Recklinghausen, Germany, owned and operated by the municipality, has arranged for sale of securities in United States, through E. H. Rollins & Sons, 44 Wall Street, and Foreign Trade Securities, Ltd., 43 Exchange Place, New York, totaling $1,500,000, entire proceeds to be used for extensions and improvements in power plant and system, including installation of additional equipment.

Rumanian Council of Ministers, Bucharest, Rumania, has approved plans for a hydroelectric power development on Ialomitza River, Moreni, with construction of transmission line to connect with present system from Ploesti to Bucharest. Plant is to be completed in 24 months. Information at office of American Consulate, Bucharest, L. J. Cochrane, assistant trade commissioner.

American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (No. E-3648) from a company at Paris desiring to get in touch with American manufacturers of special automatic screw drivers, suitable for use in garages and by electricians; also an inquiry (No. F-3655) from a company at Paris desiring to get in touch with American manufacturers of paint polishing equipment and abrasive papers.

Plans are being completed for construction of an electric generating plant by a company at Hull, England, to cost close to $1,900,000. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference England No. 63592; also at office of American Consulate, London, England, William L. Cooper, commercial attaché.

State Council, Helsingfors, Finland, is considering construction of a State-owned nitrogen plant and has appointed a committee to secure information and estimates of cost, headed by Prime Minister Sunila. Information at office of American Consulate, Helsingfors, Frederick B. Lyon, commercial attaché.

Central Electricity Board, London, England, is planning purchases of electrical machinery, including generators, engines, condensers, substation and line equipment, to cost more than $1,000,000 covering a period of several months.

NEW TRADE PUBLICATIONS

Limit Switch.—General Electric Co., Schenectady, N. Y. Folder G. E. A. 914, describing operating mechanism of a compact control for motor-opened doors, windows or valves. Major adjustment for limit of travel is made by a split cam, pinned against a gear driven from the motor to be controlled. Cams open and close contactors. Fine adjustment on contactors is made by micrometer screws.

Motors for Dusty Places.—Wagner Electric Corporation, St. Louis. Broadside illustrating air-jacketed motors. Standard induction motors from 1 to 30 hp. are totally enclosed. Stub end of shaft is prolonged to receive fan blades, and a perforated end and body shield incloses the whole so that cooling air is blown around the tight motor casing rather than through the windings.

New and Used Equipment.—Ross Power Equipment Co., 11 South Meridian Street, Indianapolis. Catalog of steam and electrical equipment, including rock crushers, engines, kilns, boilers, pulverizers, pumps, heaters, heat exchangers, bridge and locomotive cranes, compressors, machine tools, shovels, motors, generators, electric furnaces, steam turbines, hoists, etc.

Pipe Hangers, Unions, Signal Switches, Etc.—Crouse-Hinds Co., Syracuse, N. Y. Advance sheets 97, 98, 99 and 100 are devoted to hangers for pipe or wire, telephone jack condulets, self-threading unions and connectors for pipe, and signal switches for mines.

Leveling or Stretching Machines.—Torrington Mfg. Co., Torrington, Conn. Four-page folder, illustrated, describing stretching machines operated with reciprocating and also with rotary pumps. Two machines are shown which are of the mechanical type.

Electric Magnets.—Electric Controller & Mfg. Co., Cleveland. Four-page folder showing the use of electric magnets on a truck to pick up nails, tacks and other magnetic material on highways.

Centrifugal Pumps.—Pennsylvania Pump & Compressor Co., Easton, Pa. Bulletin 209, devoted to the company's double suction, single stage centrifugal pump, built in sizes to handle capacities up to 20,000 gal. per min. and for heads up to 290 ft.

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